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No. 78

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WASHINGTON, D.C.
1953

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Monument erected to the memory of Aspinwall, Chauncey and Stephens, Hotel Washington grounds.

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F. ACHARD J. W. SMITH

This is the last bulletin scheduled for appearance this year and in its contents we have continued the series of papers from Mr. A. W. Newton on the formation of the present Burlington System and Mr. Allen's account of the railroads in McKean County, Pennsylvania. Our Canadian Representative, Mr. Robert Brown has made a valuable contribution on the earliest rail lines of his country and we have selected a paper read before our New York Chapter on the Denver & Rio Grande Western Ry., for those that did not subscribe to our bulletin on that road.

The main feature of this bulletin, however, is the paper on the Panama Railroad by Mr. Alexander Saunders. It must be clearly understood by the reader that much has been written on this road since its acquisition by the United States Government and the construction of the canal. With this, we are not interested and that is why Mr. Saunders closed his account with the relocation of the old line by the Isthmian Canal Commission. Furthermore, all references to motive power and rolling stock have been omitted in this article since a subsequent article will deal with this subject.

Of primary interest to many of us is the condition of this fifty mile road at the time the United States Government acquired it. We know by report that the machinery used by the French for digging the canal

was antiquated and unfit for further service. Mr. Stevens reports the same for the railroad and its equipment. Now, this article is not an attempt to "smear" Mr. Stevens in any manner but, from the reports and newspapers, which the author has carefully examined, this does not seem to be true. It would seem that the Panama Railroad was fully capable of handling such traffic as delivered to it in a capable manner, UP TO THAT TIME. No doubt, it was incapable of handling the proposed traffic which would be added to it during the period of canal construction. It would have seemed wiser if Mr. Stevens had tempered his report a bit.

No one questions the ability and capabilities of Mr. Stevens as an engineer in charge of the construction of the canal. He was not an operating man, in the railroad sense and therein, there lies a difference. There have been many instances where short, single track railroads, manned by men with the "no how" have delivered a tremendous tonnage that calls forth every ounce of energy and admiration from all of us. It is also very easy, for a rank outsider, to criticise these efforts, especially if he comes from other fields. No matter what prompted these statements, the author has given at some detail, the expenditures, improvements, etc., during the French control during which time the railroad did not lose its identity, in order that the reader might draw his own conclusions in the matter. This road, the first transcontinental link in this hemisphere, has always been of unusual interest. We are glad to present it herewith and we hope that our members will enjoy it

Information Wanted

Prof. Elmer G. Sulzer, University of Kentucky, Lexington, Ky., author of several interesting and valuable sketches of the short lines of that state in the "Kentucky Engineer" has appealed to our membership for information relative to the three locomotives on the Louisville, Harrods Creek & Westport Railroad.

This road, starting out as an independent road around 1871, came into the fold of the Louisville & Nashville in 1881, via the Louisville, Cincinnati & Lexington R. R. It was only 11 miles long and narrow gauge and the L & N widened it to standard gauge in 1887-8. The road owned three locomotives—"James Callahan" purchased in 1872(?); the "Glenview" purchased around 1874 from a dealer or manufacturer in Chattanooga and the "Alex Duerson" purchased around 1875. All are reported to have burned wood, cow-catchers on both ends and had hand brakes. From what we can learn, these engines were never renumbered in the L & N series and were disposed of subsequent to widening the road. Now, any of you narrow gauge "fans" or anyone else, that can furnish Prof. Sulzer with any additional information or even any photographs, won't you kindly do so at your earliest convenience.

Correction to Bulletin No. 76

Mr. Robert R. Brown, our Canadian Representative, has taken exception to the title given by Mrs. Crum under the illustration opposite page 36 in that the "San Juan" is the only narrow gauge vestibuled train in existence. If we go no farther than the State of Colorado, or possibly the United States, the statement is true. But, as Mr. Brown points out, the Newfoundland Railway, which is of 3'6" gauge and recently acquired by the Canadian National Railways when Newfoundland voted to enter the Dominion, is a wonderfully equipped road. Here will be found steel sleeping and dining cars in addition to coaches and baggage equipment, drawn by modern steam locomotives. I daresay it is possible that somewhere, some other roads may have some narrow gauge vestibuled equipment. At any rate, we appreciate the letter of Mr. Brown's calling our attention to the equipment and service of the Newfoundland Railway and the fact that the "San Juan" will not be lonesome in this respect.

American Historical Association

The Lexington Group will hold their meeting in connection with the above Society in Boston, Massachusetts, Friday, December 30, 1949, Georgian Room, Hotel Statler, 2:30 P. M. Three interesting papers will be presented that afternoon—Mr. Laurence F. Whittemore, President of the New Haven R. R. will give his answer to the question—"Is Railroad History a Help or a Detriment in Meeting the Present Problems in the Industry?" Prof. Edward Ullman, of Harvard's Department of Geology and Geography will give a paper entitled—"New Viewpoints on American Railroad Geography" and Alfred Chandler of Harvard, a descendant of Henry Varnum Poor, will discuss "Henry Varnum Poor, Railroad Historian." These three papers are bound to be of interest and a cordial invitation is extended to each and every member of this Society to attend this meeting. The president of your Society has been asked to preside so don't stay away on that account.

Short History of the Panama Railroad

By Alexander Saunders

FOREWORD

Before going into the history of the Panama Railroad, the writer would like to point out to any readers who are in any way familiar with its history, that part of the story will of necessity follow a familiar pattern. It is the author's intention to give the reader some facts on the Panama Railroad not previously published and the writer has been fortunate in obtaining some new material, partly from the printed record and partly from interviews with old employees.

Since the United States Canal construction days, the railroad has been a government owned agency and that fact has made it more difficult to obtain historical and statistical material, than is the case of the average railroad. The reader is asked to overlook any omissions such as descriptions or specifications of the locomotives for only a very limited amount of such data are available. Inasmuch as the records of many of the early locomotive builders have disappeared, the source of such data would seemingly be the road itself. But, as regards the records in the Canal Zone, it appears that nothing has been kept of the older equipment, except that which was turned over to the Isthmian Canal Commission by the French.

INTRODUCTION

The history of the Panama Railroad is a story of another short railroad, much shorter than many of the famous colorful roads whose histories have been recounted in sundry articles and books. But none of these roads ever had as much importance attached them, nor did any have the difficulties of construction. The Panama Railroad became one of the most important links in world commerce; it remained so for years and its construction between the two oceans was one of the most difficult tasks undertaken by any railroad builder.

But, before considering the road itself, it would seem in order to give the reader some idea why a safe and fast mode of crossing the Isthmus was necessary, and of the conditions that existed there for centuries, with little effort at improving them. From the days of the earliest Spaniards, who came to the Isthmus early in the sixteenth century, there existed a system of trails, which were necessary for the transportation of treasures taken from the natives and sent to the mother country. Of these, two are still in existence today, tho' far from being in good condition. They are the Las Cruces Trail and the Porto Bello Trail, the latter often referred to as the "Camino del Rey" (The King's Highway).

The Cruces Trail, established in 1535, was the shorter of the two, but travel over it dropped during the years due to frequent attacks from land and river pirates. The heavy jungle growth along the trail made

ARINE LIST.

rivals.

Brooks, Geo. W. Edson, Gen. Francisco. In 41 days, with passen- on & Freic

dy Oregon, R. H. Pearson, com- from San Francisco, with 194 pas- 30 dollars to E. Flint, agent, P. M

dy Northerner, H. Randall, com- from San Francisco, with 131 pas- 981 dollars to E. Flint, Agent, P

m, P. David Captain. 23 days from and passengers to Captain. Jose Quesada. 6 days from Mon- s to M. M. Arguerrota

dwin, R. Joy, Commander 10 days 6 passengers and 600 679 dollars to the agent of the company

ndente, R. Bolarano, Captain. 32 ro, with provisions to Barroys &

Cumbrel, Captain. 22 days from and general cargo to M. Arrived ar. Daphne 18 guns F. G. Fan- 31 days from San Blas with 667

Albert Francis Capt. Cowper 13 , assorted cargo to H. G. Ry

RTARY CARD.

BOARD SHIP RUSSELL, DOA, MARCH, 21, 1852.

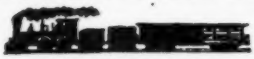
unfavorable to the condi- ell, and censuring Lieu ier, (unjustly as the un- r a full examination of s and number of passen-

therefore, that the ship ondition as represented

s the opinion of the un- s. Esq., owner of said

PANAMA RAILROAD,

For ASPINWALL, (Navy Bay.)



A TRAIN OF CARS

WILL leave "*BOHIO SOLDADO*," DAILY, on and after *Monday, March* 15, at 4 o'clock, P. M. Passengers leaving Gorgona in the morning, will reach Aspinwall the same day. The United States Steamers will, in future, come into Navy Bay, to land and receive Passengers, the U. S. Mails and Specie.

Passengers will land and embark at Aspinwall from the Company's Wharf *free of charge*.

Fare on the Railroad from *Bohio Soldado* to *Aspinwall* is fixed at the low rate of $2 (*Two Dollars*.)

Passengers from the United States leave Aspinwall at half past six o'clock, A. M., and arrive at Gorgona same day.

For further information inquire at the Railroad Office in Gorgona.

CHARLES H. GREEN, *Agent*.

Aspinwall, March 12, 1852. [mar23-1m

The "*Echo*," "*Star*," and "*El Panameño*," of this city; and the "*Herald*" and "*Alta*," of San Francisco, will please publish the above one month, and send bills to this office.

United States Mail Steamship Company.

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IMMEDIATE DESPATCH

for the above Port.

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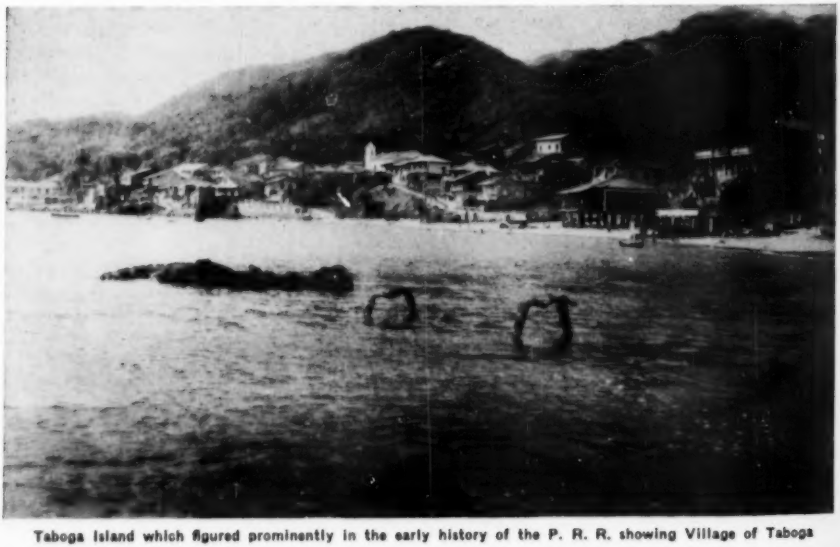
FIRST PUBLISHED TRAIN SCHEDULE OF PANAMA RAILROAD

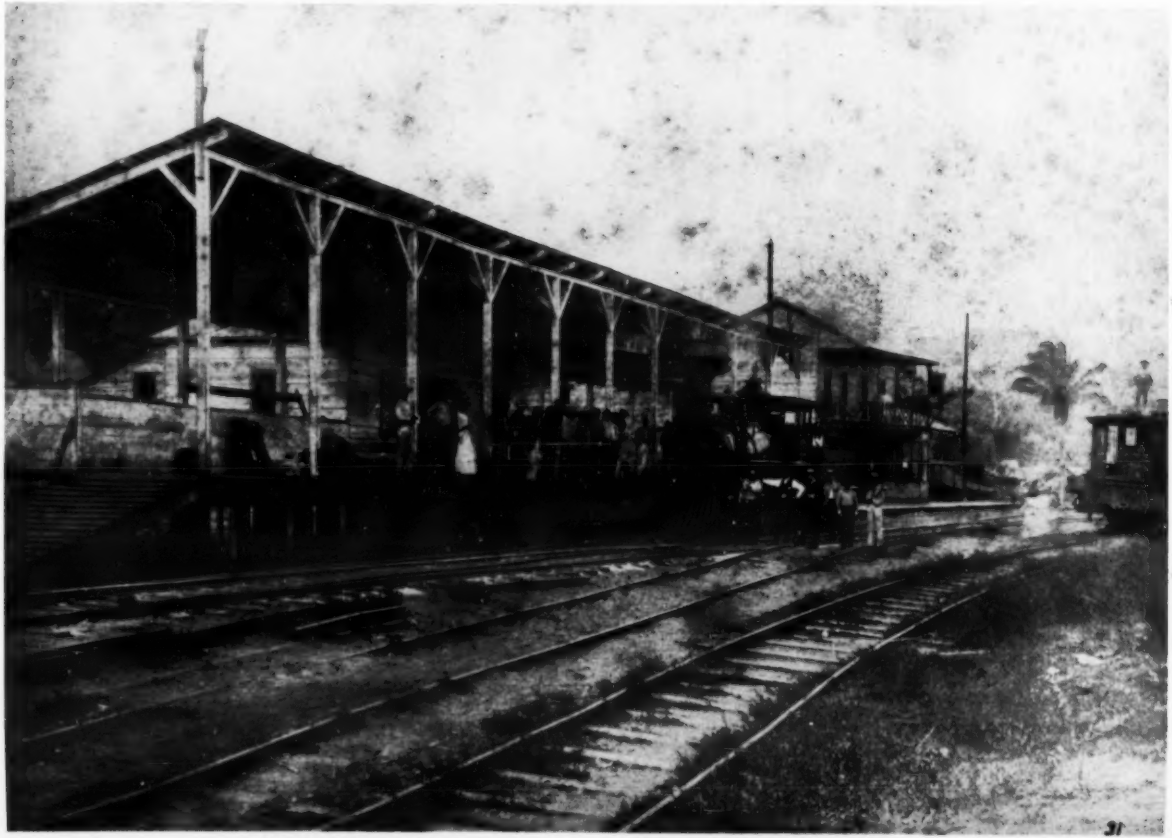
The Panama Herald, March 23, 1852

From Panama Herald

First published Train Schedule of Panama R. R., Mar. 23, 1852.

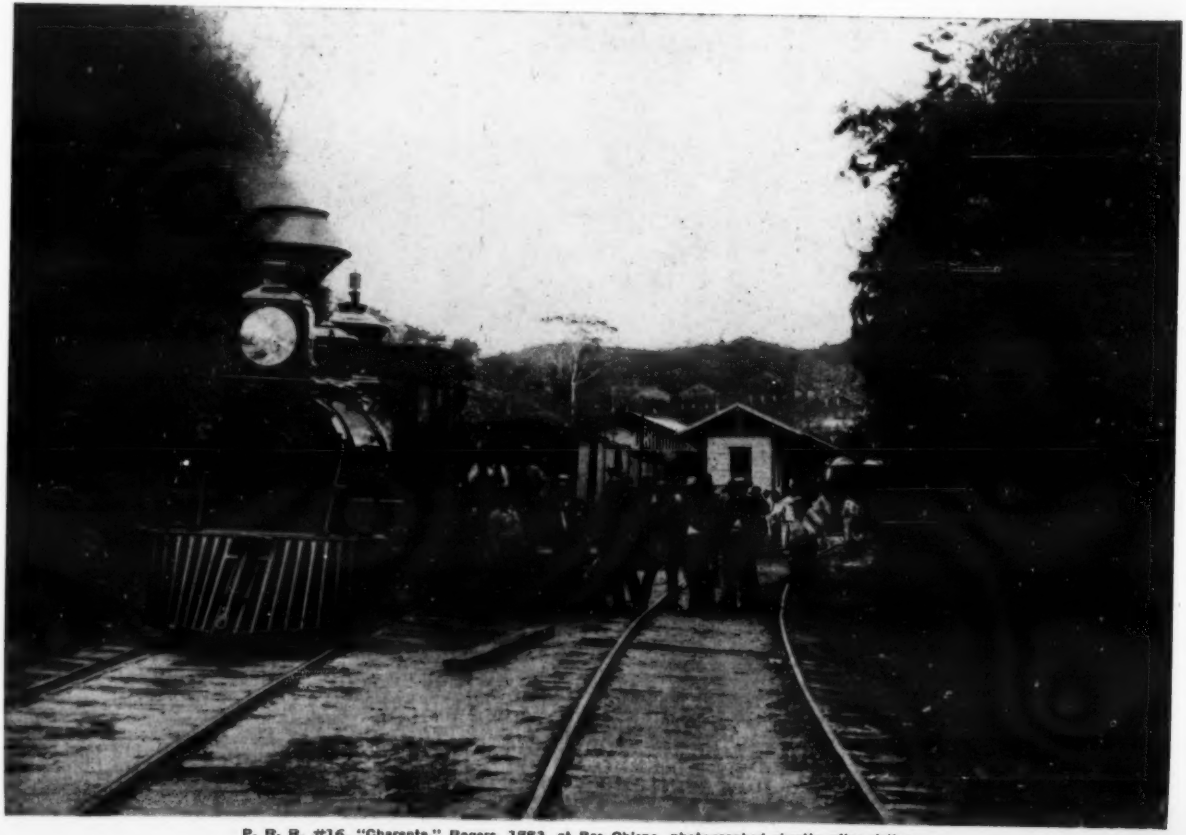


Taboga Island which figured prominently in the early history of the P. R. R. showing Village of Taboga



Matachin Station with P. R. R. #57, Cooke 1883, photographed shortly after delivery.

Matachin Station with P. R. R. #57, Cooke 1883, photographed shortly after delivery.



P. R. R. #16, "Charente," Rogers, 1883, at Bas Obispo, photographed shortly after delivery.

it ideal for such attacks, which proved a very lucrative business for these highwaymen and too often, such attacks ended in murder. This trail, beginning at the town of Cruces, on the Chagres River, crossed the Continental Divide and went to Panama City, about twenty miles distant. It was due to the explorations of Hernando de la Serna, of the Rio Grande and the Chagres, as early as 1527 that this trail was established. Vessels of very light draft, (cayucas and bongoes) could be paddled or poled to Cruces and here, passengers and freight were loaded on mules for the remainder of the trip to Panama City. This trip averaged four days, as the mules found the footing on the rounded stones with which the trail was paved, too difficult to make any speed.

The Porto Bello Trail, established in 1533, was entirely overland. Leaving Panama City, it roughly paralleled the Cruces trail for a distance, then turned up the Chagres to the headwaters of one of its tributaries, crossing the east divide to Nombre de Dios and on to the beautiful harbor at Porto Bello. The procuring of stones for these trails, and the building of them in such a climate can be classed as a major project of those days and, a very costly one.

PRELIMINARY SURVEYS

The rapid development of railways in the early part of the 19th century gave men throughout the world visions of a greater world commerce. They saw the commercial advantage of a railroad across the Isthmus of Panama. As early as 1828, the government of New Granada (Columbia), engaged a British engineer, to survey a route for a railroad from the navigable headwaters of the Chagres to Panama City. Upon completion of this survey, New Granada offered a concession for the construction of such a railroad but found no one who was willing to undertake the work.

In 1835, Henry Clay proposed, in the U. S. Congress, to have several Isthmian routes surveyed for the construction of a railroad between the two oceans, and one Charles Biddle was named to make a preliminary survey. Biddle visited at different points along the way to Panama, obtaining information from merchants and travellers who had interests along the proposed route. From Chagres, he went up the river of that name to Cruces by the primitive mode of transit then in use, and thence to Panama City by mule-back. Along the entire route, he carefully studied the country with a view to its possible selection as the proposed route of the railroad.

When the purpose of Biddle's visit was made known to the leading citizens of Panama, every facility was afforded by them for advancing the project. A new road was cut from Gorgona through the woods to communicate with the valley of the Rio Grande by portage, opening into the Pacific north of Panama. After spending some time in Panama and the surrounding country, Biddle became convinced of the importance of a railroad across the Isthmus and to the commerce of the world. In the company of Senor Jose Obaldia (The representative to the Congress

P. R. R. #16, "Charente," Rogers, 1883, at Bas Obispo, photographed shortly after delivery.

of New Granada from the two provinces, Panama and Veraguas), Biddle went to the capital at Bogota, where he applied for the privilege of constructing such a railroad. After some delay, a law was passed by the New Granada legislature, conveying important privileges to certain United States citizens in the event of their building the proposed railroad.

Biddle then returned to the United States with an official copy of the decree, firmly convinced that it was sufficiently favorable to induce capitalists of this country and New Granada to make a success of the undertaking. He considered the Panama route superior to all others, between the two oceans and he abandoned all further investigations which were to include Nicaragua and Tehuantepec. Biddle died before he could make his report to Congress and nothing came of all of his work.

England was also interested in the construction of a railway across the Isthmus but dropped it when faced with the magnitude of the task and the amount of money involved. The French had their eyes also on the Isthmus but they went further than the British. In 1841, one M. Sabla, of high social standing and official influence, received authority from the French to explore the Isthmus for a railroad route. In 1844, Napolean Garrelas and Santiago Courtines were sent to make further surveys and in 1845, one Mateo Kline obtained a concession from New Granada and signed a contract for the construction of a railroad. But again, the cost was too great and the contract and concession was lost through default.

The acquisition of Oregon and California following the war with Mexico, made the establishment of a faster and safer route of transportation to these places imperative. Large numbers of emigrants to the west made the long and perilous trips around the Horn, in order to avoid the long overland trip with its danger of Indian attack and long stretches of arid desert.

A treaty, made between the United States and New Granada on December 12, 1846, guaranteed the former a right of way across the Isthmus of Panama for any mode of transportation, either of the existing type, or any that in the future would be constructed. Congress, in 1848, in order that the west could be made more accessible, authorized contracts to be entered into for the establishment of two lines of mail steamers, one from New York via New Orleans to Chagres, the other to run from Panama to California and Oregon. These contracts did not hold out sufficient inducement to attract capital and they were taken up by parties who offered them for sale, with but little success. In 1848, two men were found willing to venture upon this enterprise, William H. Aspinwall who secured the line on the Pacific side and George Law on the Atlantic. The latter contract offered very little risk having almost immediate remuneration by reason of connecting with Savannah and New Orleans. Aspinwall, however, who was considered one of the shrewdest business men of his time, was severely criticized for entering into such an enterprise which everyone considered worthless. He soon

proved that he was still a shrewd businessman for, with his vision, he knew the line he had purchased to be but part of a plan he conceived—to build a railroad across the Isthmus, for he, together with Henry Chauncey and John L. Stephens had already entered into a contract with the government of New Granada for that very purpose.

Stephens had travelled considerably, was well versed in the laws of the State of New York and had an excellent knowledge of the country through which the railroad must be built. The contract was exclusive, carrying the privilege of building any type of transit, including a canal. The main features were that the railroad must be completed in eight years; all adjoining lands were to be the property of the railroad, as well as 250,000 acres to be chosen from public lands; the company was to establish two free ports with the privilege of establishing tolls to be collected; the government of New Granada was to receive 3% of all dividends paid by the company; the contract to run for 49 years, the property then to revert to New Granada and $120,000 to be deposited as security for the fulfillment of the contract, this to be refunded upon completion, with interest. New Granada was given an option to buy out all the company's rights at the end of 20 years for $5,000,000; at the end of 30 years for $4,000,000 and at the end of 20 years for $2,000.000.

Stephens, accompanied by John L. Baldwin, a skillful and experienced engineer, explored the route and dissipated any fears that the line could not be built without encountering heavy grades that would interfere with economy of operation. Baldwin discovered a summit pass not more than 300 feet above sea-level. A company was immediately formed and incorporated, April 7, 1849, under the laws of the State of New York. The capital stock of the company was restricted to $5,000,000., but, in April, 1852, an act was passed authorizing the issuance of stock up to a maximum of $7,000,000.

A large party of engineers under Col. G. W. Hughes, of the U. S. Topographical Survey, went to the Isthmus early in 1849 to assist Baldwin in locating the line of the road. Another summit gap was discovered, 37 feet lower than the one previously discovered and a line was run from ocean to ocean, not exceeding 50 miles in length.

The character of the country through which the road was to be built was such as might well make the hardiest of men shrink from the attempt. Its high and lofty mountains and deep morasses defied the skill of the engineer and the endurance of the laborer. The first 13 miles, at Manzanillo Island in Navy Bay, on the Atlantic side, was through deep morass and tidal swamps. Covered with a dense jungle, reeking with malaria and abounding with almost every species of wild beast, poisonous reptile and venomous insect of the tropics, only the hardiest could survive. Away from the coast, the line ran through rugged country, along steep hillsides, over wild chasms, spanning turbulent rivers and furious mountain torrents until the summit ridge was surmounted, when it descended abruptly to the shores of the Pacific. The country had a sultry, tropical heat the year around and more than half of the time deluged with rains. There was but little timber near enough

for use in the construction of permanent works and the natives were too indolent and unaccustomed to labor to be depended upon. Native resources were entirely inadequate for the support of laborers and men, provisions and materials had to be transported thousands of miles.

CONSTRUCTION PERIOD

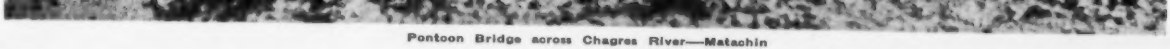
On the completion of the Hughes survey, a contract was made with George M. Totten and John C. Trautwine for the construction of the road. These two men had both had considerable experience in construction in the tropics, having just completed a canal project at Cartagena, New Granada. They immediately came to the Isthmus and selected the town of Gorgona as the place to commence their work. The plan called for steamer service up the Chagres, which was supposed to be navigable to Gorgona by vessels of light draft. The idea was to construct the shortest and easiest section first, from Gorgona to Panama City, in order to do away with the arduous mule ride from the Chagres River to Panama City, and to eliminate the dangers of robbery. The section from Gorgona to Navy Bay was to be constructed later. Two steamers were constructed to operate upriver, but even with their extreme shallow draft of between 14 and 18 inches, they proved a failure. This forced the contractors to use the primitive means of transportation such as small boats poled by natives.

It also turned out that instead of being a little known place where labor and materials were cheap, as at the time of the signing of the contract, it was swarming with emigrants from all parts of the world enroute to the gold fields. Many of these went to work for the transit company, which was paying high wages as the result of the heavy traffic. This caused new arrangements to be made for the construction of the proposed railroad and Totten and Trautwine asked for and received a release from their obligations, but were retained as engineers; Totten was made chief engineer of construction with Trautwine and Baldwin (the original surveyor of the road) as his associates. Construction plans progressed rapidly and finally, one day in May, 1850, the first ground was broken, without any announcement or festivities on Manzanillo Island. In the meantime, Totten had returned from Cartagena with 40 native laborers; part of the crew that had worked with him on the canal project in that city, and construction started in earnest.

It may be of interest to our readers to explain why the Panama R. R. was not built from Porto Bello, with its deep, landlocked harbor and where the ground was better suited for construction. This site was the first one selected but, George Law in the meantime had bought up considerable land and asked such high prices for what the railroad needed, that Manzanillo Island was selected instead.

The clearing of a right of way for the railroad was very difficult being through dense jungle growth. The working party was quartered in an old ship, unprotected in any way from the insects. If the men went into the hold to get away from the rain the mosquitos were un-

Pontoon Bridge across Chagres River—Matachin



Pontoon Bridge across Chagres River—Matachin

Gorgona—1882-1885.

bearable and many preferred sleeping on deck, in the rain. The courage and determination of these men has few equals in construction history. Totten and Baldwin, both stricken with fever, took turns working with the crew. One would stay in bed recovering from the fever while the other would go on with the work, for the laborers would work only when one of these Americans was with them. They formed a special attachment for Baldwin, working most willingly when he was in charge. For most of the first 13 miles, the men worked in slimy water up to their waists, or deeper. Baldwin would carry his lunch under his hat and eat it standing in water. In July, 1850, Trautwine who had been in the United States, returned with a surgeon (Dr. Totten, a brother of the chief engineer) and 50 Irish laborers from New Orleans.

By this time the road had been located for 2½ miles and two more had been decided upon. The distance required to go back and forth to work had become so great and was attended with such great fatigue and loss of time that it was decided to build a shanty in the swamp. The lumber for this had to be carried for more than three miles on the backs of the men. It was built high upon stumps, to keep it above the swamp. Mechanics and laborers were now arriving from Jamaica, Cartagena and the United States and quarters in the old ship became inadequate. More shanties, on "Monkey Hill" were built to house the laborers.

In August, 1850, another station was established at Gatun, about 8 miles up the Chagres River, which was navigable to this point. In this area, great difficulty was encountered at "Black Swamp", a 3000 foot stretch between Lion Hill and Ahorca Lagarto. Totten, in attempting to drive piles to hold the fill, found no bottom at 180 feet but this was finally overcome by dumping spoil around many piles closely spaced in deep mud. The number of men now employed was between three and four hundred and work progressed with vigor. More comfortable quarters and a hospital were built but sickness, due to unceasing rains and working in swamp waters a large part of the time reduced these numbers greatly. More than half of them were sick and many others deserted to the transit company thus reducing the numbers to such an extent as to halt all work. By December 1850, more than 1000 laborers were employed and, with the dry season the sickness abated. By April, 1851, a large section of the road between the terminus and Gatun had been completed.

Throughout the spring and summer of 1851, the road was located to Barbacoas, 16 miles beyond Gatun and progress was being made in extending it to Panama. In the meantime, docks had been built on Manzanillo Island and vessels were arriving daily with laborers from Jamaica and Cartagena, and from New York with machinery and materials, including several locomotives.

On October 1, 1851, a locomotive and a train of work cars passed over the road from Navy Bay to Gatun. The following month the road had a surprisingly stroke of good luck. Two steamships, the "Georgia" and "Philadelphia", arrived at the mouth of the Chagres River with over 1000 passengers for California via the Chagres River Transit, but

the weather, which was so tempestuous, that after several lives had been lost in attempts to effect a landing, they were forced to take refuge in Navy Bay. Seeing locomotives at work, the passengers asked if they could be taken to Gatun by train. The Company officials pointed out that they had as yet no equipment for the handling of passengers but their objections were over-ridden by these future Californians, who insisted they be taken to Gatun on the work cars, rather than wait for the storm to wear itself out. The company finally agreed and the passengers and their baggage were transported to Gatun, where they continued their trip by river.

The financial affairs of the company were none too bright at just this particular moment. The initial subscription of $1,000,000 had been spent and the shares had dropped to a low figure. The directors were forced to keep the work going on their individual credit, but when the "Georgia" returned to New York, carrying the news of the landing at Navy Bay and of the transporting of the passengers over a portion of the railroad, its backers felt a renewed hope, and the value of the stock climbed considerably. With the assurance of a safe passage to California passengers, for at least a part of the way, confidence in the road was revived, more money for the work became available and equipment for passenger service was immediately ordered.

THE GOLDEN YEARS—1852-1869

On February 29, 1852, at the laying of the cornerstone of the fine brick building on the island, the settlement at Manzanillo Island was named Aspinwall, in honor of the man whose vision had made this enterprise possible. By March the road had been completed to Bujio Soldado (now Bohio), eight miles beyond Gatun. Passenger trains ran in connection with every steamer and, on March 23, 1852, the *Panama Star & Herald*, published the first time schedule. By May first, the road was opened to Frijoles and on June 1st to Tavernilla. By July 6th the road had reached Barbacoas, 23 miles from Aspinwall. Men and material were being shipped around the Horn to commence work from Panama, on the Pacific side, towards the summit.

The road had hardly reached Barbacoas when it received its first military test. On July 16, 1852, eight companies of the Fourth U. S. Infantry (about 700 strong, including their families), plus 300 civilian passengers, arrived at Aspinwall on the steamship "Ohio" bound for California. Too late to go on that day's train, the regiment remained in Aspinwall overnight. The next morning passengers and baggage were loaded on the cars, but the locomotive was too light to haul more than half of the troops, so two trains were despatched. At Barbacoas the regiment divided; the main body going to Gorgona by pole-propelled bongoes and from thence on foot to Panama. One company under the regimental Quartermaster Cap't. U. S. Grant, with the women and children and baggage, was ordered to go up the river to Cruces, a few miles beyond Gorgona. At Cruces, mule transportation was to have

been ready under the terms of an army contract with the steam-ship company, but mules could not be obtained for the troops due to the high rates offered by the civilian passengers. After waiting three days, Captain Grant finally hired mules at double the prices offered by the civilians, charging the cost to the steam-ship company. Exposure to rain, muddy roads, cholera and jungle fever hampered the troops on both routes and, in addition the troops ate contaminated food and drank indiscriminately. Order and organization was impossible and the small guard at Cruces was unable to protect the baggage, much of which was abandoned. The troops finally arrived in Panama, wet, muddy, tired and hungry. When the regiment, after four weeks delay, finally arrived in California, about eighty men and nearly as many women and children had died.

The train schedule between Aspinwall and Barbacoas was announced on October 5, 1852, with no Sunday trains, except upon arrival of steamers. The fare was $8.00.

Up to now, the building of the road had cost much more than had been anticipated, and with the hope that the remainder of the road might be constructed more economically, the directors decided to complete the road from Barbacoas to Panama by contract. An agreement was signed with Minor C. Story to complete the construction.

The work under Story started with the building of a bridge across the Chagres River at Barbacoas. The river, at this point, flowed through a deep and rocky channel about 300 feet wide and was subject to sudden floods, often rising forty feet in a single night. The bridge was almost completed, when one span was swept away by one of these floods. Story had other troubles, too. Many of his laborers were Irish who were unable to endure the climate. They were badly cared for and soon their numbers were so reduced that the contractor found himself unable to finish any part of the work for the price agreed upon. In one year, he had accomplished only one-tenth of the work contracted for. The work faltered and almost stopped entirely. For this, Story was very much criticized in the local press for by this time the construction of the railroad had come to be a livelihood of many thousands of the residents of the Isthmus.

Story was released from his contract and for a time the only work done was additional surveys. Then the company took over again, going at the work harder than ever. Laborers were recruited from all parts of the world—Jamaica, Ireland, India, England, Germany, Austria and China; some 7,000 workers in all. With this large force, the company anticipated an increase in the amount of work accomplished proportionate to the increase in the number of workers, all of whom were supposed to be in fine physical condition and able to withstand the climate. It was soon apparent, however, many of them could not adapt themselves to either the work or the climate.

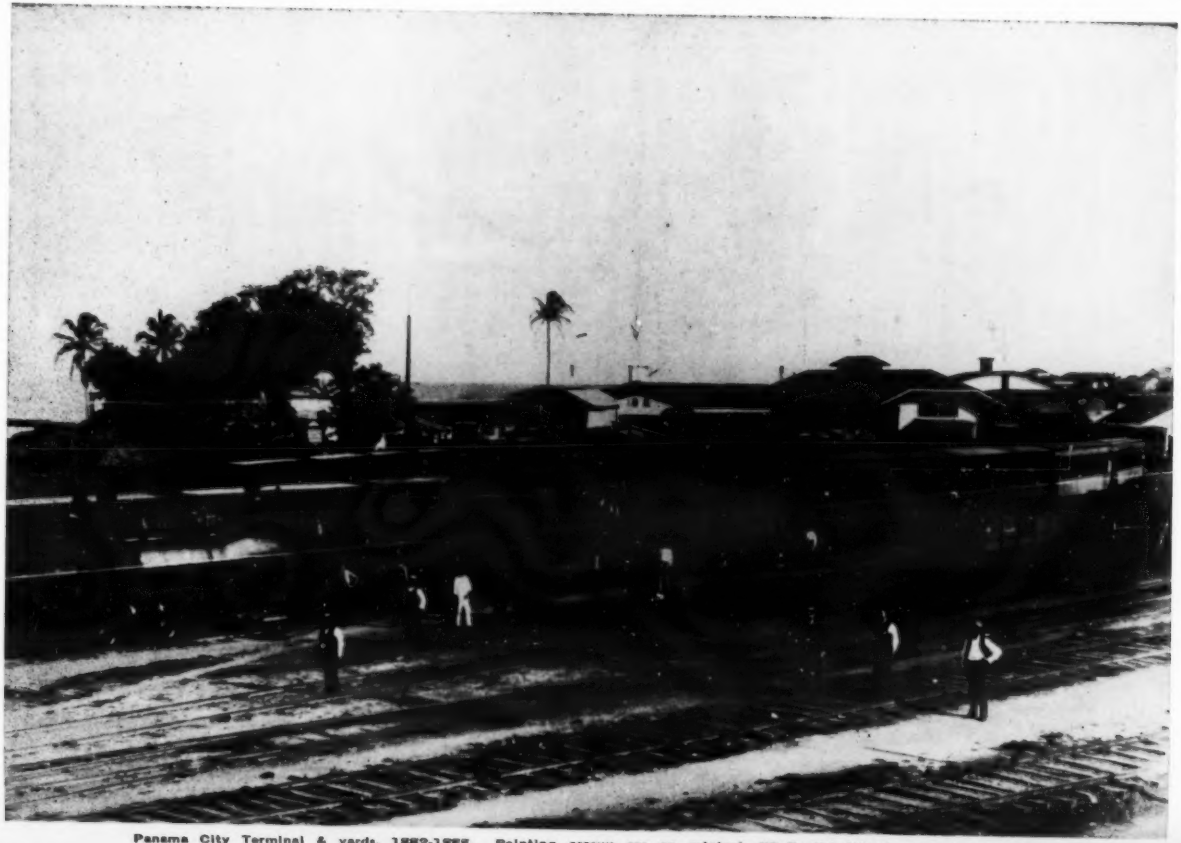
The year 1853 was a hectic one for the builders, for in addition to taking over construction, many other problems had to be faced, not the least of which was the Chagres itself, which could be depended upon to

make things interesting at any time. The rainy season started in March that year, earlier than any living resident could recall, and in those rains little work could be done. Many complaints had been received from passengers about the slipshod methods used by the transit company, between Cruces and Panama. Public notice had been posted about the indifferent service rendered by the river men who had caused a great loss of baggage and personal property as well as serious delays to passengers. The rates from Cruces to Panama by mules were 18 dollars per person and 17 cents per pound for baggage. It was not strange that complaints were numerous. The railroad and the steamship lines were asked to put the overland part of the journey in good condition. This appeal brought good results and all three companies agreed to repair the road, putting it in such condition that passengers could make the trip from Aspinwall to Panama the same day they landed.

On October 1, 1853, the first fatal accident occurred. The 3:30 train left Aspinwall with 600 passengers. Passing Monkey Hill, it slowly approached the Mindi River where there was a sharp curve in a cut that contained a bridge, view to which was obscured. As the train approached the bridge, a bull was sighted on the bridge but the train was too close to stop and it collided with him. The locomotive, four baggage cars and two crowded coaches plunged into the valley killing two, a native and a United States citizen on his way to California.

The massive wooden bridge at Barbacoas was rapidly completed and, on November 24, 1853, the first train passed over it to Maumei Station, causing great joy in Panama and great confidence was expressed in the progress being made. On December 14, 1853, a notice was published to the effect that full train service was extended to Maumei and January 1, 1854 was the date fixed for the opening of the railroad to Obispo, thus eliminating the river route entirely. Panama City, meanwhile, was anxiously waiting to hear the whistle of the "iron horse" and on March 30, 1854, came the welcome announcement to California-bound travellers, that the transit time across the Isthmus had been reduced to six hours.

On July 13, 1854, a train ran to within a mile of the summit, leaving a total distance of a little over 12 miles to be completed. This part of the construction was slowed down by difficulties such as quicksand and water filling in the cuts between Obispo and Summit Station. Travellers in 1854, expecting nothing but a shed for a railroad station at Summit, were pleasantly surprised at the orderly array of buildings and the cheerful energy displayed by the workers. Instead of the jungle growing close to the right of way, the land had been cleared for a considerable distance from the tracks and, instead of the expected shed, mud and jungle, they saw a village of about 2,000 inhabitants. After reaching the summit, the building of the road was much faster than in the low land on the Atlantic side, but it was not without trouble in that several embankments on the Panama side of the summit had to be rebuilt several times.



Panama City Terminal & yards, 1882-1885. Pointing arrows are on original #2 English Wharf. #4 Panama Wharf.

All this time highway robberies and frequent murders were continuing and the railroad came in for its share. Authorities of New Granada had been unable to stop these attacks and gave the Panama Railroad permission to do its own policing, granting full authority to the company with regards to the punishment of any guilty parties apprehended. On July 22, 1854, the company signed a contract with one Ran Runnels to organize a police force to protect the railroad's interests and workers. Runnels, who had been a commission merchant and agent, since 1851, had been escorting his own mule trains across the Isthmus for some time. His methods proved effective and it was not long before his trains of specie and valuable express were avoided. He organized a force of twenty men to work with him on the railroad and by October, they had run off all the brigands from the road.

The railroad made its longest cut at summit ridge, which it reached January 1, 1855. This cut was 1,300 feet long and 24 feet deep and required the excavation of 30,000 cubic yards of earth and rock. The working force from Panama City was moving up the valley of the Rio Grande to meet the force coming from the Atlantic side and at midnight, on January 27th, in a pouring rain, the rails were joined, thus completing the railroad which had been started more than four and one-half years before. The length of the entire road was 47 3/5 miles, with a maximum grade of 60 feet to the mile. On the next day, the first train ran over the entire road and a big celebration was held in Panama City.

The official celebration in honor of the completion of the railroad was held on February 15, 1855. It was attended by the directors and other dignitaries who had arrived in Aspinwall from New York on the steamer "George Law" together with about 500 California-bound passengers, who were just in time to join the festivities. The train was stopped at Matachin, where the delighted crowd went to the nearby hill to dedicate a monument. When the festivities on the banks of the Chagres had finished, the emigrants after this most welcome diversion from the monotony of their trip, were reloaded and continued their journey to Panama and California.

To one who has never seen a tropical jungle, it may seem strange that a railroad, less than 50 miles long, should have cost nearly $140,000 per mile to build, especially where no heavy grading, no tunnelling and no rock cutting of any importance had to be done. Without the least suspicion of dishonesty, how could the total cost be so enormous. The wonder is that the road was built at all!! Running through a country that seemed absolutely impassable, even today, along the Isthmus, one can see the dense masses of tangled jungle growth on either side of the railroad forming an impenetrable green wall to the water's edge. One might well ponder where men could be found to penetrate and conquer this wilderness. In his book—"The Isthmus of Panama," C. T. Bidwell, British Vice-Consul in Panama (1865) pays this tribute to the builders of the Panama Railroad:—"The peculiar position of the Isthmus of Panama naturally makes it a very important position to South America, California and world commerce. This the Americans undoubtedly per-

ceived when they undertook, and carried out with such indefatigable energy that which England and France, after repeated and expensive surveys, certainly failed to accomplish, namely; a railway from sea to sea. All honor to them, therefore, for their spirit of enterprise. We in England have talked and still talk of Isthmus canals and railways, as we have talked for some years of a line of steamers via Panama to Australia, but with our talks and our surveys we get no further."

Daily trains were started soon after the joining of the rails. On the Atlantic side four approaching tracks were laid and three on the Pacific to take care of the ever increasing traffic. A machine shop, 150 feet long and 50 feet wide, stocked with first class machinery to take care of all necessary repairs was built at Aspinwall; also a blacksmith shop with six forges and a small brass foundry. A car repair shop, 100 feet long and 80 feet wide was also erected. Freight houses and passenger depots were built at each terminus and suitable accomodations for employees were constructed. Aspinwall had little claim to distinction architecturally. Its buildings were some 200 in number, of wood, and styled midway between a New England dwelling and the veranda type found in the tropics. The head of the wharf was reached by quadruple tracks. Towards the end of the island, beyond the shops and hotels, was the Panama Railroad office building, a fine two-story brick structure, into which the wires of the Isthmus Telegraph Co. converged through the upper windows.

On the Pacific side, at Panama, large vessels had to anchor off shore and all cargo was handled by lighters or small boats. A warehouse and pier was constructed at the Panama terminus for embarking and landing passengers and freight. The company, in connection with the Pacific Mail Steamship Co., purchased a group of four islands in Panama Bay, affording good shelter and anchorage for vessels of the largest class and well supplied with good spring water.

Commencing at Aspinwall, the Atlantic terminal, the road skirted the western shore of Manzanillo Island for about three-quarters of a mile, then crossed the channel that separated the island from the mainland at a point nearly in the center of the breadth of the island and then ran around the southern and eastern shore of Navy Bay, until it reached the Mindee River, cutting off a bend of this river about 1,000 feet from its mouth. From that point, it stretched across the peninsula, formed by the bay and the Chagres River, to Gatun. The road continued along the right bank of the Chagres as far as Barbacoas, 23 miles from Aspinwall. Crossing the bridge there, it continued along the left bank of the river to the mouth of the Obispo River, 31 miles from the Atlantic terminal, leaving the native town of Gorgona on the left. After crossing the Obispo River, and striking the town of Obispo, the line followed the tortuous valley of this stream (see map) to its head in the summit ridge, 37 3/8 miles from the Atlantic terminal and 10 1/5 miles from the Pacific. The lower part of the Obispo River, being crooked and bound in by precipitous hills, compelled the line to cross this stream twice within the first mile. It then passed the summit ridge

through a cut a quarter-mile long and 24 feet wide, to the headwaters of the Rio Grande, which flows into the Pacific. Following the left bank of this stream, and descending by a grade 60 feet to the mile for the first four miles, the line crossed the Pedro Miguel, Caimitillo and Cardenas Rivers near their entrance into the Rio Grande. It then stretched across the sabannas of Corissal (Corozal) and the swamps of Correndieu (Curundu), cutting through the spur of Mt. Ancon (Ancon Hill) to reach the Pacific at Playa Prieta, a northern suburb of the city of Panama, approximately where the Church of the San Francisco now stands.

In May, 1855, the Panama Station was nearly completely enclosed and the tracks in the yards and the wharves almost finished. Evidently a portion of the population had no faith in the future of the country for some of the largest businessmen were closing out their activities and leaving for Europe, the United States and other places. The same month, a train with passengers from New Orleans made the trip across the Isthmus in 2 hours and 5 minutes. Compare the equipment with that of today, that makes the run in one hour and thirty minutes, with a new track and light bridges and trestle work and the run was something of a record. Even though the road was in working order and performing an increasing daily service, it was far from being in a permanent condition. Much of the work, especially on the Pacific side was of a temporary nature, streams were crossed on temporary trestles, made of local timber and not expected to last more than six or eight months—all done in order that the company might take immediate advantage of the thousands that were crossing the Isthmus every month and to save a thirteen mile mule ride over a dangerous trail.

The company did not long delay in correcting this situation and it soon began to assume a permanent appearance. However, in order to keep the traffic down in order that the work might be carried on, the management established a very high schedule of rates. First class passengers were charged $25.00; children under 12, $6.25. Second class passengers paid $10.00; personal baggage was 10c per pound; mails were 22c per pound; coal $5.00 per ton, first class freight including merchandise in boxes and bales, 50c per cubic foot and all other classes of freight had a correspondingly high tariff, payable in *gold*. Although this tariff went into effect June 1, 1855 and although some complaints were received through public notices and the press, many sections of this tariff remained the same for twenty years.

Permanent construction was obtained by replacing temporary trestles with embankments, temporary bridges were replaced with those made of iron resting on stone abuttments. The company brought stone masons from New York and they did a beautiful and lasting work, the quality of which may be seen in some of the photographs taken in the 1880's. No less than 170 bridges and culverts were constructed; 134 of them under 10 feet in length the remainder from 12 to 625 feet in length. The bridge across the Chagres River at Barbacoas is typical of the strength and durability of the bridge work all along the road. This

fine structure, completed in 1857, consisted of six iron spans, each over 100 feet in length, with top and bottom beams two feet wide and one inch thick, joined by a web of boiler iron, 9 feet high at the center and 7 feet at the ends. The tracks was supported on iron girders three feet apart and the whole structure was supported by five stone piers and two stone abuttments, 26 feet wide and 8 feet thick, increasing in the proportion of an inch to the foot down to their foundations. The latter were constructed of piles and concrete, built up 40 feet above the normal level of the river. The bridge lasted for more than half a century and was considered one of the longest and the best in the world at the time of its erection.

The original soft wood ties were replaced with those of lignum vitae, so hard and durable that some of these original ties dug up in 1910, were still unrotted and so hard that holes had to be drilled in them before a spike could be driven. The first rails were flat iron bars laid on wooden stringers but these were soon replaced by the hollow or inverted "U" rail, and this in turn was replaced by a light "T" rail between 1853 and 1859. The road was well ballasted for its entire length. Station houses for the local superintendents were built at four mile intervals along the entire line and telegraph communication was established between the terminals. The first message sent over the completed telegraph, was sent from Panama by station Superintendent J. W. Johnson on August 12, 1855.

All of these improvements were accomplished during the first two years of operation. Next came the enlargement of the wharves at Aspinwall. Substantial bulkheads were erected and much of the island (Manzanillo) was filled in. Streets were laid out and additional buildings erected. Also, a reservoir was constructed in a natural basin, some two miles from town, from which water was conveyed to the town in iron pipes. When the construction account was closed in 1859, the total cost to that time was $8,146,605.00. The running expenses, with depreciation, were more than $2,000,000.00, three years of which the road was only in partial operation. The company had paid its interest regularly on its indebtedness and, in 1852 had paid a 10% dividend on its stock; 8½% in 1853 and 7% in 1854.

On April 15, 1856 occurred a dreadful event involving the railroad. A train carrying a full load of passengers arrived at the Panama Station early in the evening, only to find that the small steamer which was to take the passengers to their ship anchored in Panama Bay would be delayed for several hours. The passengers, being told of the delay, sought diversion, each to his taste or desires. One passenger after taking more liquid refreshment than was good for him, got into an argument with one of the natives in one of the bars but it was stopped before anything serious happened. The passenger then left the place only to encounter the same man at another bar, and, after more arguing, he pulled out a revolver and commenced shooting. Friends of the native joined in and it soon became a free-for-all fight in a very short time. Other passengers became involved and a natural retreat towards

the railroad station began with the lawless element in pursuit. Arriving at the station the fighting became heavier and several hundred passengers sought the protection of the building. The police, led by Governor Don Francisco Fabrega, joined with the mob firing on the passengers, robbing them and looting the station. Not long after this, May 6, 1856, the road had one of its worst wrecks. A train bringing passengers from Aspinwall to Panama was derailed. The first passenger coach left the tracks and the eight cars behind it, filled with passengers, were completely smashed into small pieces, killing 40 injuring 60 persons.

A special treaty in February, 1857, gave full protection to the railroad, seemingly the result of the massacre of the preceding year. It gave the United States Consul the power to call the police to quell any grave situation occurring on the railroad. If the local officials should refuse to bring out the police, the Consul had the authority to order the police out and, if this was refused, he had the power to organize police from other personnel. It was also agreed that in the event of war between the United States and New Granada, the Panama R. R. was to remain neutral and neither country was to interfere with its operation.

On October 14, 1858, a passenger train crossing from Aspinwall to Panama was blocked by a slide at Obispo but it was believed that the slide could be removed in time for the travellers to reach Panama later in the evening. Three or four passengers, among them F. N. Otis, the author of the book on the Panama R. R., took a hand car and reached Panama about 7 P. M., with news of the accident. A train with another crew was sent out and the passengers were carried to Panama the next morning, the slide proving to be greater than first estimated. This was the time Otis got the material for his book as he spent some time on the Isthmus.

No date is specified, but the following schedule of regular daily trains except Sunday, was put into effect sometime between the completion of the road and 1859. It does not include extra trains of which there were many to handle the heavy traffic the road developed. Steamer trains also, were not included in the regular schedule. This latter service had developed a very high rate of efficiency, the railroad not permitting any delays to the trains.

TO PANAMA				TO ASPINWALL		
Passenger Leave	Freight Leave	Miles	Stations	Passenger Arrive	Freight Arrive	Miles
8.15 A.M.	2.00 P.M.	——	Aspinwall	1.00 P.M.	5.30 P.M.	47½
8.50 A.M.	2.35 P.M.	7¼	Gatun	12.25 P.M.	4.55 P.M.	40¼
9.38 A.M.	3.20 P.M.	16	Bujio	11.45 A.M.	4.15 P.M.	31½
10.00 A.M.	3.45 P.M.	22½	Barbacoas	11.15 A.M.	3.45 P.M.	25
10.40 A.M.	4.25 P.M.	30	Matachin	10.40 A.M.	3.10 P.M.	17½
11.20 A.M.	5.05 P.M.	37	Summit	10.00 A.M.	2.30 P.M.	10½
Arrive	Arrive			Leave	Leave	
12.15 P.M.	6.00 P.M.	47½	Panama	9.00 A.M.	1.30 P.M.	——

On January 23, 1860, the following was printed in the New Orleans *Picayune*, "The Panama Railroad has declared its semi-annual dividend of 6 per cent., as usual, making a total of 12 per cent for the year, al-

though its business for the year justified a dividend of 24 per cent. The surplus for the year, after paying all expenses and the 12 per cent dividend, is stated to be $900,000.00, a showing which probably challenges any road in the world. The stock closed today at 133¼." In the autumn of 1860, the New York stock market praised the stock of the Panama Railroad as being one of the most stable on the market. The directors' consciences must have bothered them, for in October a statement was published that, late in 1859, the directors voted to pay future dividends of 6 per cent quarterly. No reason was given as to why the news of this decision had been withheld from the public for almost a year. Available information on this detail is vague, but it appears that the 24 per cent dividend for 1860 was not paid. The reasons given for the reversal of this decision were changes in the local political situation (New Granada was at war) and a decline in the California passenger trade. Another reason advanced was that the road was to revert to New Granada in 1876, as per original contract, on payment of $5,000,000.00 and some fanatics in New Granada had started to voice their determination to have the road before the stipulated period. The railroad's representative, Mr. Sandford, who had been sent to New Granada that year to negotiate for another lease, was rewarded with complete failure. The Panama press had other reasons for this, hinting at a "bear" assault on the Panama Railroad stocks to gain control of this rich dividend payer.

The business of the road seemed to contradict the directors' reasons for not paying a higher dividend. Due to a great increase in business during the first half of 1861, the company reduced the rate on passenger baggage from 10c to 5c per pound. Freight business on the road kept improving as shipment of all kinds of Central and South American products were encouraged, and, sensing an opportunity for profits from their products, these countries responded. The increase in this trade must have been considerable for the statement of 1861 showed that passenger receipts had dropped to 3/7 of the total revenue.

The greatest gale which had occurred up to this time hit Aspinwall on November 21st and 22nd, 1862. All communication was disrupted and a train that left Panama on Monday, November 24th was able to get only as far as Frijoles, from whence it had to return to Panama. Repairs to the damage done the railroad were undertaken promptly and in a few days travel across the Isthmus was resumed. In another encounter with an animal, this time a cow, a freight train was derailed about 7 miles from Panama, overturning 8 freight cars and tearing up some yards of track. A passenger train which was running behind the freight train was held from early evening until midnight before arriving in Panama. Those cows seemed to have been of a size comparable to Paul Bunyan's famous blue ox, Babe, or the Portland locomotives were of very small size.

In 1863, the name "New Granada" was replaced by that of "Columbia", though no official statement has been located. One paper read by the author states that "after an insurrection in 1860, the name

of the country was changed to United States of Columbia and later to Republica de Columbia."

Aspinwall or Colon, seems to have been a city of frequent and disastrous fires. A report dated January 1, 1863 gives an account of one which, on December 26, 1862 destroyed much public and private property, including the railroad offices with a total damage of $250,000. The same year, great regret was expressed on the Isthmus, when word reached there of the death of Mr. Henry Chauncey, one of the original promotors of the railroad, he having died on May 1, 1863. During all this period, however, all that could be learned of Mr. Aspinwall, was in the report of another fire at Aspinwall, on May 30, 1864, when two more blocks were destroyed, the account stating that property damaged included "the City Hotel owned by 'Wm. H. Aspinwall, Esq., of New York.' "

On April 21st, 1865, a new contract arrived in Panama to supersede the one of 1850, between Columbia and the Panama Railroad. The general terms of the new contract were as follows: The Government was to concede to the Panama Railroad, entire and perpetual ownership of the railroad and all its appurtenances. No person or company would have the right to construct a railroad or a canal within 150,000 meters on either side of the railroad. The company was to pay the Government $500,000., and to issue (in addition to the 50,000 shares which then formed the capital of the company), 18,000 shares at $100 each, in favor of the Columbia Government—these shares not to be transferable and carrying no voting rights. The Government was to receive 26 and 8/17% of the dividends and have the right to appoint one of the directors. The railroad was to extend its line to the four islands in the Bay of Panama, or to some other point where the water was at least 8 meters deep at low tide. The Government on its part, would concede to the company the necessary lands required for the line, wharves, etc., if such lands were Government property. The road was to receive land in Panama for its needs from the Government from private owners, of course paying for the land belonging to the private owners. The company was to transport government troops, mail and other government property gratis and to renounce all rights for damage claims arising out of the outbreak of April 15, 1856.

While this contract was under consideration, the desire to get something for nothing became quite a popular pastime with the Columbians. In February, 1866, General Mosquera, minister from Columbia to Great Britain and France, brought the Panama Railroad into the open market in Europe. Part of his note, written to the Columbian Secretary of the Treasury on this plan, states that he had occupied himself in establishing a basis on which to negotiate advantageously the reserve of the Panama Railroad and that he had received the following proposals:

> "The Government shall receive $5,000,000.00 to pay the present company with, in 1874, as the price of the railroad, according to the terms of the contract; they shall receive the $500,000.00 which Mr. Totten had offered and $1,800,000.00 besides in cash, instead of the same sum in shares.

"Columbia shall further receive the profits corresponding to $5,000,000.00, which will represent the value of the road, it being well understood that the mail business is entirely for the nation. The republic shall bind itself to grant to the new company the privilege for the time which is still unexpired for the present one, and prolong it for 60 years more, after which period the railroad shall be national property. I do not doubt that the government will find great advantages for the nation in the terms of this contract, and I suppose that they will bring them to the knowledge of the American company, *in order to endeavor to obtain from them still more advantageous conditions.* I shall bring with me all the data of this transaction. London, Nov. 9, 1865. Mosquera."

About the middle of 1866, Mosquera received a loan for Columbia of $7,500,000 from Messrs. Robinson and Fleming of London, apparently taking upon himself much of the authority for the loan. But, after sundry deductions for commissions, etc., Columbia received but $5,000,000. With this, they purchased two war vessels for $1,000,000 each and another million went for the Buenaventure Road. A revolution threatened over this loan and the small amount left for the government. This meant that either new taxes had to be levied, or the money on the Panama Railroad deal had to be realized. During the year many discussions were held, on whether to accept the railroad's offer or to sell the Panama Railroad to Mr. William Cotterill of London. Through the whole affair, the people of Panama were opposed to the Mosquera policy.

Some time during 1867, the company assumed a negligent attitude in the handling of goods transported across the Isthmus. It would handle only such business as was brought them by their regular customers and handle it in any way that it saw fit. If the customers did not like the treatment, they need not use the road. One example that might be cited, is the treatment of a steamship company which wanted to transport 20,000 tons of coal across the Isthmus. The Panama Railroad told the steamship people that it did not care for that kind of business and the coal was eventually shipped around the Horn at $5.00 per ton, the road thus losing a revenue of $100,000. One reason for this attitude may have been that the road was trying to devalue the property to such an extent that a new contract with the Government, more favorable to the company could be effected. If Col. Totten had studied the affairs of the Union Pacific Railroad closely, it is the writer's opinion that the Panama Railroad could have gone right on making its usual profits and still have made a good contract with Columbia.

In 1867, Col. Totten went to the capital of Columbia to negotiate a new contract. After much discussion, an agreement was reached and signed, tho' unfavorable for the railroad. In brief, the terms of the contract were to run for 99 years (today, Panama can hardly wait for this agreement to run out, since it is anxious to take over the property in the section known as New Cristobal, Fort De Lesseps, and other sections with all the buildings thereon)—the contract provided for an immediate payment to Columbia of $1,000,000.00 in gold; an annual payment of $250,000 for the full term of the contract; an agreement to make such improvements as were deemed necessary and an extension of

Famous Barbacoas Bridge after completion of relocation, and shortly before dismantling, prior to flooding of Gatun Lake.

P. R. R. #319, Baldwin 1907, closing the Chagres River out of the west diversion, Apr. 24, 1910.

the line to deep water to the group of islands in Panama Bay on the Pacific side.

Under the new contact, Manzanillo Island (Colon), which was to have been the property of the railroad forever, was to revert to Columbia at the end of the contract. When this news reached New York, it sent Panama Railroad stock down from around $200 per share to about $80. The legislation covering this contract was passed by the Columbian Congress in Bogota on August 15, 1867 and signed by a representative of the railroad two days later.

It is interesting to note that more than 400,000 passengers were transported over the road during the 13 year period ending December 31, 1867 and there is no record of a single case of sickness occurring in consequence of transit across the Isthmus since the opening of the road in 1855. The diseases contracted in transit previous to this time were of a malarious character, resulting from exposure and fatigue, so often unavoidable when the transit was by mule-back and in open boats, consuming four to eight hours. Travellers were frequently obliged to eat the vilest food and sleep on wet ground. The railroad reduced the passage from ocean to ocean to three hours, (now 1½ hours) and demonstrated a perfect immunity to the various illnesses popularly recognized under the head of "Panama Fever." Sanitary conditions established at Aspinwall were similarly carried out along the entire line of the road. The draining and filling of swamps and lowlands improved the living conditions so much, that fever which had reduced the ranks of the laborers in the early days of the road, was rare. By 1860, living conditions along the railroad compared favorably with many similar new settlements in the western states.

The amount of specie transported by the Panama Railroad between 1855 and 1867 was more than $700,000,000.00, without the loss of a single dollar. During the same period 300,000 bags of mail were transported, the greatest part of which was mail between the Atlantic states and California, also without loss. Many thousand tons of freight went over the road during that time, and losses in transportation were trifling. Having a monopoly on ocean to ocean transportation, the company asked and received enormously high rates for its services. The stock, paying its owners good dividends, was one of the strongest on the New York stock exchange and was very much in demand. These were the golden years of the road!

It has been stated, that had it not been for the California trade, the Panama Railroad would have had but little chance of being able to show a profit. However, in 1858, its business with Central and South America exceeded the California trade nine times and this was later increased to such proportions that the California trade was only one-fifteenth of the total. The California trade had a strong come-back between 1860 to 1867 amounting to one-third of the business during those years. The rolling stock of the company was always ample and 1500 passengers with their baggage, the U. S. Mails and freight from three steamship lines, were frequently transported over the road in a single day.

Soon after the new contract was signed, other troubles came to the road. The Pacific Steam Navigation Co. had tried to get a better division of rates than the high tariff of the road permitted. It and other steamship companies made threats to use other routes, unless some agreement, better for all concerned, were not made. A tentative agreement between the steamship companies and the Panama Railroad was presented to the railroad directors but they turned it down. The result was the loss of the greater part of the South American trade.

On March 26, 1868, another big fire broke out in Colon, this time in the carhouse of the Panama Railroad, destroying the large wooden structure as well as 43 freight cars, 32 of them being loaded with freight. The damage was estimated at $175,000. On July 25, 1868, a freshet washed out part of the embankment near the Obispo station and, though repairs were rushed, the cut was not cleared until the 27th. On August 8th, a train jumped the tracks at Gorgona, overturning the engine and killing the crew. A larger flood on November 25th, the same year, raised the waters of the Chagres and Obispo Rivers to 28 feet above normal level. Traffic was suspended and the telegraph was put out of service.

Yet despite these accidents and losses of property, the Panama Railroad reached the peak of its prosperity in 1868. The gross income that year was $4,337,668.00 and the cost of operation was $2,030,185.00. Yes, the ten years ending with 1868 were the golden years of this railroad.

DECLINE AND RECONSTRUCTION, 1869-1879

The competition of the Union Pacific R. R., which commenced in 1869, dealt a heavy blow to the Panama Railroad for it took away from the road much of the profitable mail, specie and passenger traffic. Col. Totten, basing his opinion on the difficulties in the construction of the Panama Railroad, had not expected the Union Pacific to be completed for another 20 or 25 years. The loss in revenue was immediately reflected in the statements of the Panama Railroad and by 1871, the gross revenue had dropped to $1,284,418.00, operating expenses of $997,875.00. Panama Railroad stock dropped and was a football on the New York stock exchange. Competition by the steamship companies, with their reduced rates, forced a similar reduction by the road. A temporary and exceptional increase in the percentage of working expenses to gross earnings was due to the impossibility of keeping the expenses down as revenues decreased. To offset this decline rigid economy was established. A demonstration showed that the transportation of freight between New York and San Francisco via the Isthmus could be satisfactorily carried on in competition with the Union Pacific, both as to rates and time, and at even lower rates than those charged by the competing railroad. The local papers berated the New York offices of the road for not attempting to stimulate ship commerce, pointing out that the West Coast was being rapidly developed and needed the commerce which the Panama Railroad could tranship to them much quicker than having it come around the Horn. This inaction, it was pointed out, had dropped

the railroad's stock to a record low of $52 per share. It was pointed out also that if the railroad did not change its policy, it would be better to close up shop. A suggestion was made to organize a group to take over the railroad and make it the paying proposition and an instrument of public service that it really could be.

Mr. Hoadley, the president of the road, wrote the Columbian Government in March, 1871 (which fact was not disclosed to the public until August of that year), indicating the financial condition of the company and its inability to make the agreed-upon quarterly payment. He mentioned the $1,000,000 that was paid in 1869 and pointed out that while in September of 1868, the stock had been worth $369 per share, it was worth but $79 in March, 1871.

Not long after writing this, Hoadley resigned and was succeeded by J. F. Joy, the former secretary. That same year, Alden R. Stockwell conceived the idea of capturing Panama Railroad stock. He obtained a sufficient number of proxies to control the annual election and had himself elected president to succeed Joy. Stockwell lost the road to Russell Sage, but between the two the road received its worst mis-managment—their main desire to squeeze everything possible out of the road. Despite this, the stock rose steadily during 1872, the published quotations being 133 in September, 145½ in October and 145 in December.

In 1874 Sage turned the management of the road over to Rufus Hatch, assisted by J. B. Houston. At the same time an investigation was made of the fiscal agency, expressly for the purpose of uncovering crooked dealings. Hatch could not understand how those people could handle millions without giving security, and stay honest. The looting of the railroad had dropped its shares to a new low and they were accumulated by T. W. Park, an able and honest financier. Gaining control at the next annual election, 1875, he stopped the investigation and, on August 25th, the board of directors exonerated the fiscal agent of any dishonesty.

An article written on January 10, 1876, stating the writer had visited the railroad shops a few days earlier, reported that the conditions there were the most inefficient existing on any railroad. The company, the article stated, owned 18 locomotives, all Portlands, which had been very good locomotives when purchased but repairs had been neglected to a dangerous degree for a railroad of such great importance to world commerce. (The neglect to repairs had caused the "Darien", a switcher to explode with such force that, besides killing the engineer, the engine had been completely destroyed). The condition of the cars was just as bad, the rain entering in many places and not a single pair of replacement wheels were in the shops. The right-of-way and track were also inspected with the same results; rails and ties so worn that most of them needed replacement and most of the stations were closed! And this, despite the fact the road had encouraged the banana trade which was steadily growing, one shipment by Frank Brothers, in 1875, had a freight bill of $5,676.00. On February 12, 1875, a train of 25 cars, the longest in the road's history up to that time, went over the

road and was headlined in the newspapers. For the first time since the road was built, the residents of Panama (meaning the whole Isthmus) were offered commutation tickets at reduced prices.

Mr. Park, upon his election to the presidency in 1876, sent Mr. P. Mosley to the Isthmus, as General Superintendent, to straighten out its affairs. Mosley started a general house-cleaning of personnel and a thorough repair of the road and its equipment. Claims for lost and damaged freight that consumed a large proportion of the earnings of the road were reduced so that it was rare indeed for goods or packages to be missing. Double-heading of trains were discontinued and pushers used over the steeper portions instead. A little more of the Hatch-Houston regime would have left the traditional streaks of rust in the jungle.

In March 1877, there were ten locomotives in good running order, two were undergoing repairs, one ready to leave the shops and two, laid aside as unfit for further use were to be rebuilt. The road owned 24 passenger cars, four baggage cars and 230 box cars all in good condition. Exclusive of the great bridge, it took a month to restore the roadbed sufficiently to run trains over it for neglect had caused deterioration along the whole line. After temporary repairs were made, permanent repairs were started. Breaks in the roadbed were filled with stones from the Bujio Quarry and a waterway was built at Mindi to protect the right-of-way from floods. A bridge was built over the waterway, leaving an opening of 40 feet where before the clearance had been much smaller, and in flood time all surrounding streams flowed into this channel. The bridge was on temporary piles, scheduled for replacement in three years. The roadbed was again solid and as good as any in the United States. The lignum vitae ties were better than those used by any other railroad in the world and 500 tons of new steel rails were laid in 1877.

Traffic that year increased somewhat and it appeared that the road had now settled down to a well-organized system. Regardless of the criticism Park had received, his management was efficient and freight and passengers increased. At the close of 1878, 23 miles of new steel rails had been laid, with new fish-plates, and a 1000 more tons of rails were on order. Heavy rains had caused damage only to the extent of washing away some ballast. Stone masons were again brought down from New York to repair and rebuild all culverts and bridge abuttments and the great increase in coffee trade in 1878 justified the company's order for 100 new freight cars.

The Railroad had completely recovered from the Hatch-Houston regime. In 1879, 13 more miles of new steel rails and fishplates were laid and a sufficient quantity of rails were on hand to finish the remaining 11 miles. More rails were on the way from England to relay the yards in Colon and Panama. Mosley resigned as superintendent in 1879, after having done a fine job in reorganizing the road, and was succeeded by his assistant, H. A. Woods.

On June 30, 1879, the Panama Railroad protested an order issued by the Columbia Government, prohibiting the road from transporting

munitions or armaments to the countries at war in the Pacific. Columbia refused to revoke the order, indicating their authority by referring the road to certain clauses in the contract of 1867, which had certain restrictions written into them. And in Panama, there was considerable discussion regarding the building of a canal across the Isthmus, plans for which were gathering considerable headway.

"The proposal for a canal across the Isthmus was the result of the organization in Paris in 1876, of an association known as 'Société Civil Internationale du Canal Interocéanique' to make surveys and exploration for a ship canal. In May 1878, Lieutenant Wyse, in the name of the association, obtained a concession from the Columbian Government which was later actively prosecuted. In May 1879, an International Congress, composed of delegates from Great Britain, United States, Germany and France (but mostly from France), convened in Paris under the leadership of Ferdinand de Lesseps who had completed the Suez Canal in 1869. It was the purpose of the Congress to consider the best solution for an interocean canal and after several weeks session, it was decided that the canal should be at sea level and at Panama." *

Following adjournment of the Congress, the Panama Canal Company was organized with de Lesseps as president, and the so-called Wyse Concession was purchased for 10,000,000 francs. As a railroad was necessary to the French in building the canal, and as the railroad held prior rights for the construction of a canal, the Panama Railroad was purchased by the French Company late in 1879.

PERIOD OF FRENCH OWNERSHIP, 1879-1903

The French paid $17,000,000 for the stock of the road, plus a bonus of $1,102,000 to the directors for their good-will, which with the outstanding bonds assumed by the French, made a total cost to them of nearly $25,000,000 or approximately one-third of the subscriptions received by the French Company for the commencement of the work on the canal. The railroad directors received permission to distribute most of the surplus funds of the company to the stockholders as a dividend just before the sale of the road. Park, who is said to have cleared $10,000,000 personally on the transaction, resigned and was succeeded by J. G. McCullough, an American interested in the French Company. The French were very optimistic about the canal becoming a reality, and fate did not reveal to them the gloomy picture that would present itself in a few years.

On November 6, 1879, a terrific gale accompanied by very heavy rains, hit Colon causing the heaviest flood ever to be recorded. Rain continued without let-up for fifty hours. Some sources state that the force of this gale was so great that water backed up inland for thirty miles. This resulted in serious washouts, and caused at least eighteen breaks in the railroad.

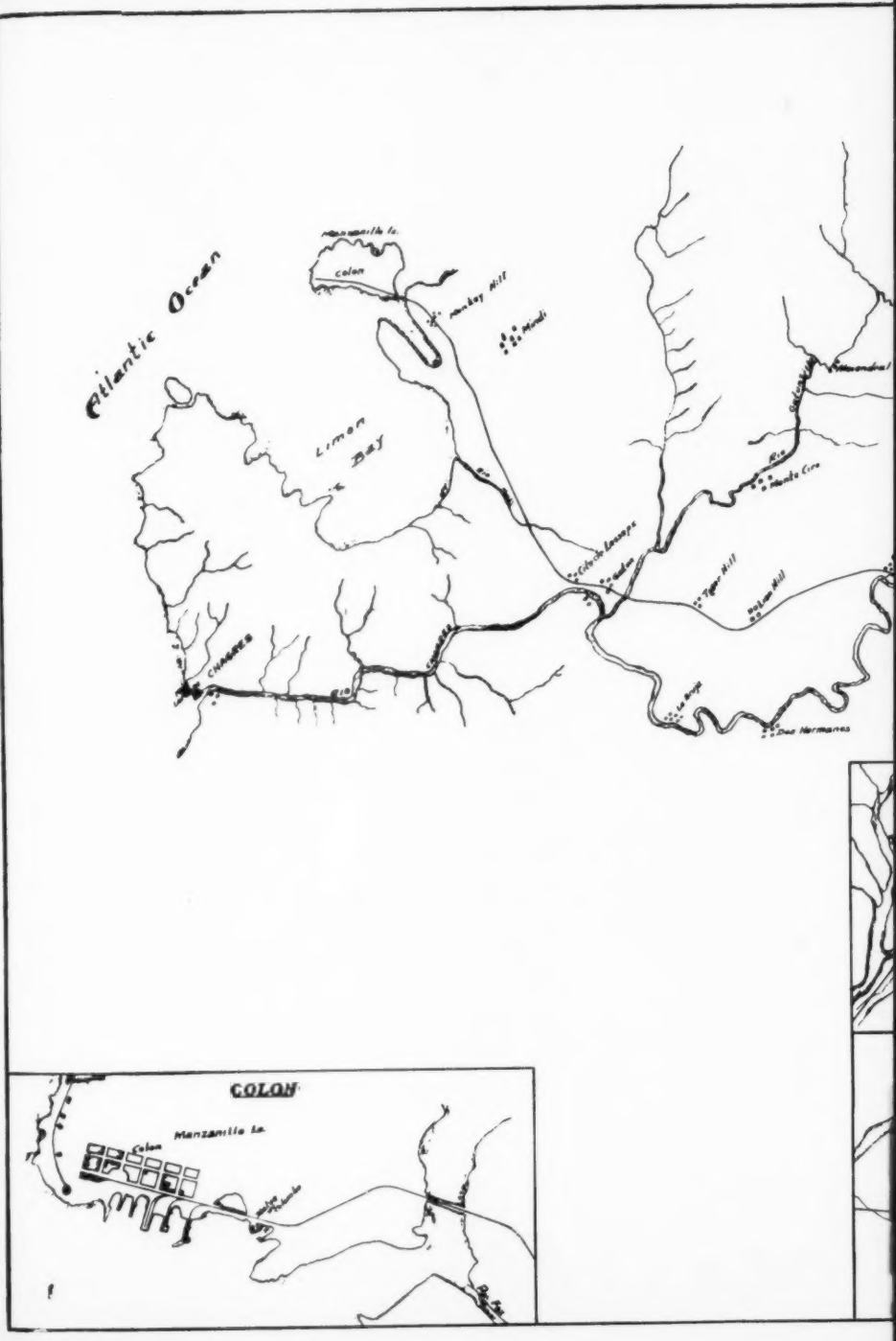
* Encyclopaedia Britannica, 1941 edition, Vol. 17 p. 175.

The Chagres River rose 46 feet in less than three days, so undermining the great bridge at Barbacoas that traffic over it was stopped for six weeks. This caused more than 20,000 tons of shipping to pile up before traffic was resumed. Considerable damage was done to the wharves at Colon and at Paraise, 80 feet of road-bed slid down the mountain, leaving the ties and rails suspended in the air.

On December 30, 1879, de Lesseps and his party arrived at Aspinwall on the S. S. Lafayette. There was a great fanfare on the Isthmus over his arrival, the press describing him as the man, who, more than any other was identified with the commercial hopes and prospects of the Isthmus and of the world. The next morning de Lesseps and his party left Colon for Panama by train. The train was met at Barbacoas Bridge, which was still undergoing repairs, by the President of the State of Panama, after which the party was transported across the river to another train by means of which they reached Panama. De Lesseps and Col. Totten, again crossed the Isthmus on January 6, 1880, leaving the train at Matachin and continuing the trip for a distance down river by canoe. A newspaper article of January 7, 1880, stated that, though Colon had been called Aspinwall for sometime, its correct name "was and is now" Colon, although at the opening of the railroad on February 15, 1852, it was New Granada's own minister who suggested the name "Aspinwall."

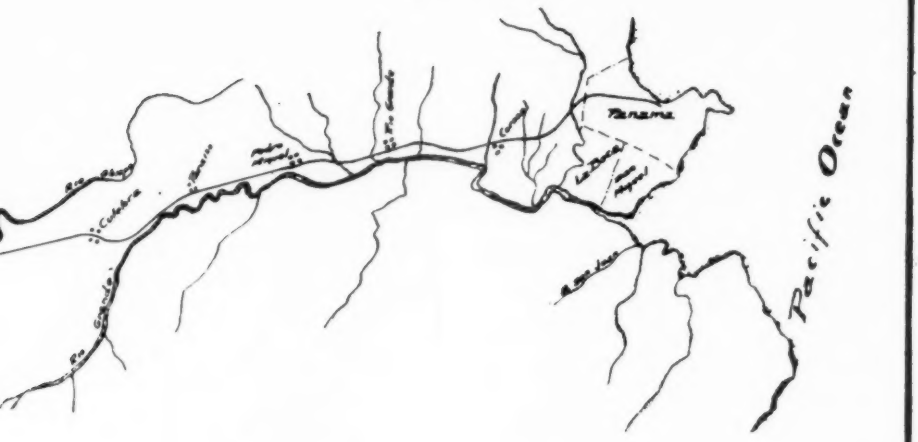
A reminder of modern "progress" occurred in February, 1880, when the railroad laborers struck for higher wages, saying that the 90c per day which they had been receiving was too low to meet the prevailing high prices. No alarm was felt, since they had been working overtime repairing the damage caused by the flood and they had also been attending public carnivals which lasted then the same as today, four days. It was felt that when the men had recovered from their celebration they would come back to work. However, a raise in pay to $1.20 per day was granted them.

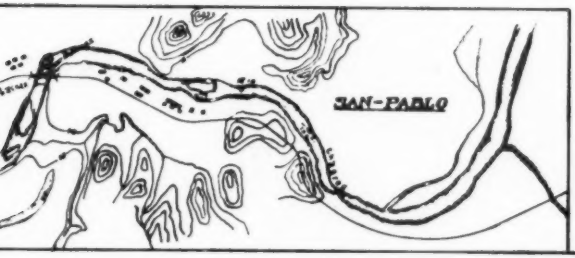
Early in 1880, two 4-4-0 freight locomotives were received from the Baldwin Locomotive Works. These were able to haul double the number of cars pulled by the lighter Portland engines, thus reducing the train service considerably. There was a very noticeable pick-up in train movements, due to impending canal activities. A Baldwin switcher was received later in the year and proved so satisfactory that a request was made for the early delivery of a similar engine. On August 1st, 1880, Sup't. Woods announced that the pay of the laborers would be reduced to $1.00 per day and this promptly caused another strike. He was unaware of the agreement to keep the $1.20 per day in effect and, upon learning this, he revoked the reduction order, but the men refused to go back for less than $1.50. Woods, bringing new men from Jamaica, went by train to Barbacoas without anything unusual happening. There, thirty-one men who had not heard of the strike were taken along to work in Panama. After small arguments at Maumee and Matachin, the laborers old and new, were locked in two boxcars for protection from the strikers. As the train approached the terminus at Panama, a mob of strikers stopped the engine with obstructions, opened the two cars and

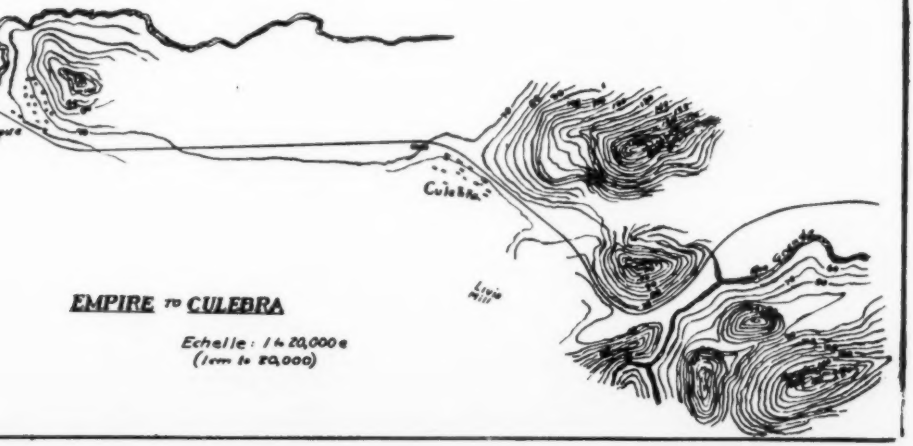

Atlantic Ocean
Colon
Monkey Hill
Limon Bay
Chagres
Tiger Hill
Dos Hermanos
COLON
Manzanillo Is.
Colon

BUHIO-SOLDADO
OBISPO
GORGONA

Chemin de Fer Panama
1884







EMPIRE to **CULEBRA**

Echelle : 1 à 20,000e
(1cm to 20,000)

began to stone and club the men inside. Police and soldiers broke up the fighting and a strong force was placed at the stations to protect the engine and crew. The governor prosecuted "vigorously" the men involved, who were charged with stopping and attacking a train on the highway. The strike was settled when the men agreed to return to work at a permanent wage of $1.20 per day.

By the middle of August 1880, all locomotive engineers but one, were on the sick list and regular trains were no more. The master mechanic was the only man left capable of taking a train across the Isthmus, and he did so as often as he could, expressing fervent hope for the speedy recovery of the others.

Early in 1881 trucks and iron work for new cars were received from the Wason Co., of Springfield, Mass., the bodies being put on in the road's own shops. The damage sustained by the flood of November 1879, had been completely repaired, and by the spring of 1881, the road was in good condition its entire length. In June, another fire in Colon destroyed the car shop with all tools, machinery and some cars, leaving only the stationary engine and boilers. By the end of the year a new shop was completed which was larger and better equipped than the old one. Two more road locomotives and one switcher were ordered from the Baldwin Works. With the expectation of more traffic, the company requested 50 new box cars and a like number of flats. Old first-class coaches were converted to second-class and new first class coaches ordered, of a type adapted to the climate.

Supplies and machinery for the construction of the canal increased traffic during 1882 and in September, the road-bed and track were thrown out of line by an earthquake. Save for three or four structures this caused but little damage. As the French activities expanded, the building of additional sidings became imperative. The two road engines and the switcher were delivered by Baldwin making a total of 12 road engines and 4 switchers. The new box and flat cars and four new passenger cars were received together with trucks and iron work for 60 more platform cars to handle the new traffic. Two more road engines and another switcher were ordered from Baldwin and the road reported a net earnings for 1882 of $1,306,406.00.

In 1883, Woods was replaced as superintendent by J. J. Iriby, a Frenchman. The change was not satisfactory, the main reason being that the business of the road was conducted in the English language and Iriby's manner of supervision did not make for the best co-operation. He was subsequently replaced by G. A. Burt, an agent of long standing with the former owners and who took but little dictation from the French.

Additions were made to the docks and wharves in Colon to accommodate the large number of ships that were coming in with all sorts of material. The revenue from the canal company continued heavy, with a proportionate profit to the railroad, but South American trade had been steadily falling off. The new management pointed out in a report, that the line was inadequate for the traffic that was placed upon it and

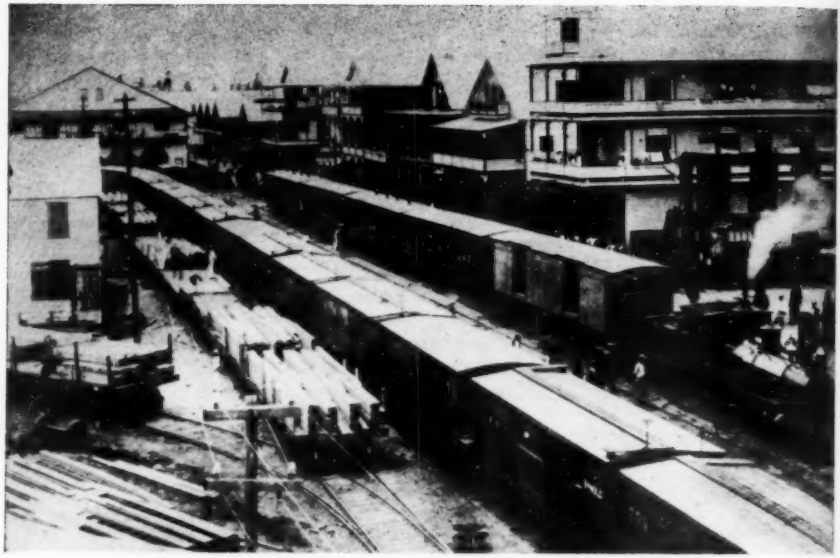
requested additions and replacements. Large numbers of new ties and rails were needed for replacements at the Colon and Panama stations. The curves had become so dangerous that new ties were put in regardless of delays to traffic. New ballast became a "must" and all bridges needing repairs were put in order at a cost of $154,722.37 or $3,257 per mile.

At the close of 1882, there were thirteen stations on the line, established in the old centers of population or near the works of the canal company. These were increased to twenty-four in 1883 and the canal company kept asking for more. That year the road owned fifteen road and six switchers, a total of twenty-one locomotives; seven road engines and two switchers the property of the canal company. Panama Railroad locomotives No. 13 and No. 20, both Portlands, were unable to render satisfactory service any longer and another Baldwin switcher was requested for use in Colon since those ordered by the French could not make the curves leading to the wharves. The number of miles run by all locomotives (owned by the railroad) in 1883, was 286,435. The rolling stock seemed sufficient but fifty more box cars and six more passenger coaches and two baggage cars were ordered to forestall any unforseen rush of business.

Track facilities at Colon were far from adequate for the increasing demands of the growing traffic, so additional side tracks were provided. As the only apparent solution, it was proposed to build another yard at the south end of Manzanillo Island. Company buildings, like the tracks were also becoming inadequate and in 1884 a new freight-house was recommended in anticipation of heavier traffic. In the meantime, a new freight house was being built in Panama. Here also, a large splendid passenger station was contemplated for early construction. It was to be two stories high, 600 feet long, with a large number of tracks and a very large platform. It was to be built in sections in New York and sent to the Isthmus to be assembled.

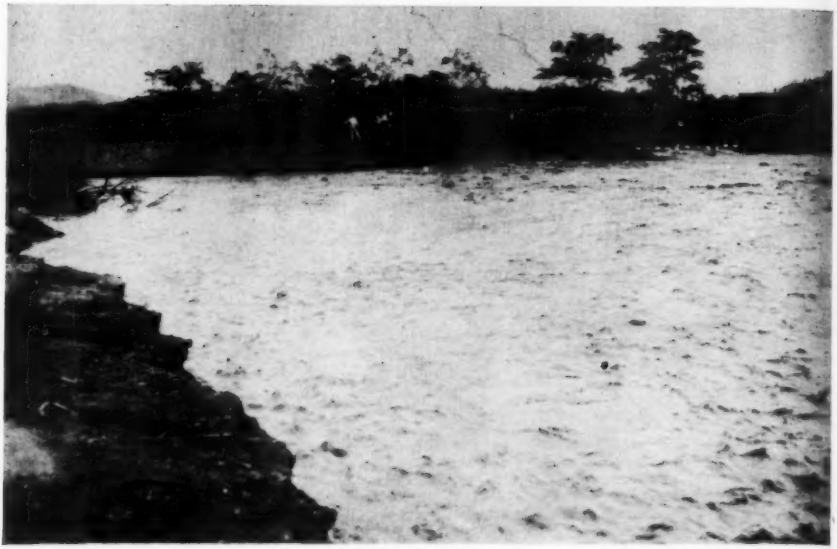
Due to difficulty of furnishing the locomotives with water along the road, a series of water stations were planned at Gatun, Frijoles, Matachin and Panama. By reasons of single-track operation, the telegraph stations at Bujio Quarry, Maumei, Matachin and Summit, built only a year previous, were declared inadequate. It was decided to establish new stations at Gatun, Tavernilla, Empire and Rio Grande; Summit to be abandoned. New dwellings and quarters were needed for employees as the climate had deteriorated those already built.

The French used the railroad as a base for a large part of their operations, so that at times the offices were combined. The railroad carried much of the French equipment and a large part of the excavating materials, with very little record being kept, but the road never lost its identity and at all times remained an English-speaking railroad. Trans-shipments from coast to coast were carried as before and the corporate offices of the road remained in New York, as required by the charter. The French changed the maintenance divisions, dividing the road into four sections with four districts to each section. There was a foreman and twelve laborers to each district and this virtually doubled



P. R. R. #18, "Durance," Rogers 1883, in old Front St. Yards.

P. R. R. #19, Rogers 1883, brings the paycar to Gatun



U. S. #510, former French locomotive, filling in across Chagres River, Jan. 28, 1911.

Excavation for Hydro Electric Station, Gatun, looking towards forebay, April 14, 1917.

the section forces. Since traffic kept increasing in 1884, this increase in crews was probably needed. This meant more business for the railroad but there was a noticeable increase in traffic between Europe and the west coast of South America. Many improvements were made that year to buildings, bridges, culverts and accessories; thousands of new ties were laid, embankments along the whole line were widened, a start was made at ballasting, all sidings were relaid with steel rails thus removing all iron rails from the line; sidings were lengthened and a number of new ones put in and twelve new switches were put in to accomodate the canal business. The yards at Colon and Panama were re-laid with steel throughout and in Panama seven new tracks were added. Even these could not care for the traffic and additional tracks were planned for the following year. At this time there were 84 switches on the main line; 25 of the Lorenz pattern and 59 of the split-switch type, used by the canal company. The latter were to be removed as soon as possible, not being adapted to the type of rail then in use. Bridge repairs were very costly in labor and materials. The extremely heavy traffic and the heavier locomotives made it necessary to strengthen them with diagonal bracing. The round-house in Panama was rebuilt to house twelve locomotives instead of four. The station at Panama was put in good order but was too small for the heavy passenger traffic and was moved to a point near the bridge, adjoining the Savanna Road.

The situation at Colon was congested and constant maneuvering was necessary to obtain sufficient storage space for cars, even tho' three additional tracks were laid during the year, one of which was 2,500 feet long. The road had 18 road and 9 switching locomotives. Of the road engines, six were Baldwin, seven from Rogers and five from Cooke. The switchers were four Baldwin's, three Hinkley's and two Rogers'. The variety of motive power was due to the French ordering them for their own service and then turning them over to the railroad. The total mileage run by the locomotives in 1884 was 402,623 and the average cost per mile to operate was $.343.

A difficult problem presented itself in 1884, that of obtaining sufficient water for the company during the dry season. Steam pumps were erected at Gatun, Frijoles, Matachin, Pedro Miguel and Panama and tho' the tank capacities were increased, the water famine was acute in Panama to the extent that the road, for the first time had to carry water in cars to supply the ships in Panama Bay. Ten telegraph stations were erected that year, besides the two at the terminals. These were necessary for safety and to insure regularity in transit. Two through wires were operated, one for railroad business exclusively, the other for commercial use. The increased traffic required additional passenger trains and a new time-table went into effect Oct. 5, 1884 which proved very satisfactory.

The maintenance expenses of the French reached their highest point in 1885, but due to political unrest and the great fire in Colon, which occurred on March 31, 1885, operations on the road were completely stopped for two months. The fire completely destroyed the city together

with the railroad's wharves and sheds. Reconstruction was immediately started. The company also laid five miles of new steel rails from Empire to Matachin, but the road needed re-ballasting along its entire length. The Mindi bridge was still in use but was shortly to be replaced by one with iron girders.

One writer compared the Isthmian commerce in those hectic days as "The eddy of the stream that flowed with great constancy along the rails and transit." In 24 years, 1876-1899 inclusive, 5,330,959 tons of merchandise of all classes were transported over the Panama Railroad. A considerable portion of this, of course, resulted from the hauling of materials and supplies for the French. The French, evidently seeing that their operations were eating away their capital very rapidly, had the transportation rates lowered considerably, thus incurring a large decrease in revenue. De Lesseps was having increased difficulty in obtaining additional stock subscriptions to his canal company and this had considerable bearing on this action, no doubt.

More reconstruction was done in 1885 than in any year since the road was in operation. The old rails from Empire to Matachin were used to extend the side tracks at Matachin, Lion Hill, Gatun, Maumei, and the Colon and Panama yards. One thousand tons of new 70-lb. rail were received in 1886 and was placed in service between Empire and Rio Grande. A new iron bridge was erected at Mindi and the flooring of the large Barbacoas bridge was renewed. Iron stations were built at Colon and Panama and all the stations along the line were put in charge of Panama Railroad agents, the type of work required being far beyond the speed that the French agents were accustomed to. Local traffic had increased to such an extent that new stations had to be built at Gatun, Lion Hill, Ahora Lagarto, Frijoles, Maumei, Culebra, Pedro Miguel and Mira Flores. A new seven stall roundhouse was built so that all motive power would be under cover when not in use.

In 1886, 320,928 tons of freight were handled, the largest in one year up to that time. The system of cash collection of fares on the trains, which had been used extensively up to the present, resulted in a new ticket system being adopted with the result that 799,264 passengers were counted that year. More locomotives were turned over to the road by the French and the motive power in 1886 consisted of 25 road and 8 switching locomotives—six Baldwin, six Rogers, one Hinkley and twelve Cooke; all but the Baldwins having been originally ordered for the canal company. The road owned 345 box cars and there were 281 additional, the property of the canal company; 204 coal cars of which the railroad owned forty and 164 belonged to the canal company and 482 flat cars of which 393 were the property of the canal company and 89 belonged to the railroad; nine cattle cars, eight cabooses, two funeral cars and two specie cars. Though the French saw the forthcoming failure, de Lesseps by this time had agreed to build a series of locks (prior to this he insisted on a sea-level canal) but the earnings of the road continued to increase and the general condition of the road was improved.

On December 28, 1887, the Panama Gazette published an article from Senor Francisco de Fabrega, General Department Secretary in Panama, to J. B. Allen, Assistant Superintendent of the road stating instances where individuals had been injured by being thrown from moving trains on which they were evidently travelling, without paying fare. The Secretary informed Mr. Allen that in the future a guard would be sent with each train who would arrest all persons travelling without tickets. Mr. Allen agreed to this proposal to place police on the trains and co-operated with the authorities with every means in his power, keeping his promise, Sr. Fabrega placed police guards on the trains and numerous conflicts of the past were avoided.

Earnings of the road continued to increase in 1888 but the affairs of the canal company were in a precarious position. The through traffic was the bright spot in the business of the railroad. Deviations in the main line were made at Maumei, six-tenths of a mile; eight-tenths of a mile at Cascades and three and nine-tenths miles, including a "Y" at Culebra. The canal company, digging too close to the tracks at San Pablo, together with a sudden rise of the Chagres, caused a serious break in the road at that point in December. Several bridges were carried away and telegraph communication was halted and by noon of December 15, 1888, it became evident that trains from Panama could not go beyond Maumei. That afternoon, at Matachin, a mile beyond, only roofs of the houses could be seen and the railroad station, one of the highest points in that section, was submerged. The canal dams at Bohio and Palomatea were washed away. On the Atlantic side, trains from Colon could not reach Mindi and it was December 25th before trains began crossing the Isthmus again.

In December 1888, a financial crisis hit the French Company and failure followed. Though the railroad was doing a satisfactory business, this failure caused a great depression on the Isthmus and a large number of people found themselves without means of a livelihood. The railroad suffered a heavy loss in revenue and this caused a reduction in the working forces without impairing its efficiency. Fortunately, the bridges, road-bed and tracks were in excellent condition. In September, 1890, a fire in Colon destroyed 17 city blocks and the railroad again lost its general offices, yard buildings and forty-three freight cars.

Due to the concession from Columbia, the work on the canal never completely stopped; the work was carried on by the receivers in a half-hearted way. These receivers and the second French Company that was organized in 1894, adopted the same policies towards the railroad as the original canal company. One of the projects of the new company was the building of a deep water terminal at La Boca. Today, there is a native workers' settlement named La Boca, but sections of what had been part of the old town, farther inland, are now within the boundaries of the present town of Balboa.

The traffic decrease starting in 1888 and continuing into 1893 was very marked. In the latter year, the Panama Railroad went into the red for the first time, although it was claimed that the earnings were

sufficient to meet all expenditures and fixed charges but not enough for dividends. Maintenance was not neglected, some 2400 cars of ballast being placed on the main line and 500 tons of new 60-lb. steel rails laid and all bridges were overhauled.

At the request of the French, and at their expense, an iron bridge was erected by the railroad at Cucaracha to admit the passage underneath, of the Culebra dumping tracks. The railroad and the steamship companies made a new contract, by which the railroad was given freedom from competition on the Atlantic side, in exchange for the exclusive rights given the Pacific Mail Steamship Co., to bill goods from the Pacific to Atlantic ports.

In spite of a loss of $110,061.36 in 1896, the railroad was showing improvement in operation costs. A reduction in the working force and the construction of modern facilities had shown a beneficial effect. Furthermore, it was the railroad's intention to abolish the fifty-year-old system of lightering at Panama and to construct a huge pier so that ships could be loaded and unloaded directly to and from the trains on this pier. The cost of these and other improvements was estimated about a million dollars.

For the three years, 1893, 1894 and 1895, the net earnings averaged $614,781.00 but in 1896 they jumped to $1,035,301.00. These were years of aggressive competition to secure and establish a firm position, which was attained towards the end of 1895. An explanation for the non-payment of dividends during the period from 1893 to 1896 is that the company found it advantageous to apply the net earnings to the purchase of the three large ships and otherwise improve its increasing transportation interests. On the Atlantic side, the company established its own steamship line between New York and the Isthmus, which for a time was the only line between these two points. Its three new steamships, aggregating 8,193 tons burden, operated on this exclusive service. The year 1896 gave promise of bringing better times for the railroad and its extended service.

In 1896, the railroad reduced its operating costs by $42,406.86. The station at Colon was moved to a more central location in the town, opposite the company's freight house. The new location was not only more satisfactory to the passengers but permitted easier operation. A high-level tank was erected in Colon to supply water for the Mechanical Department; protection against fire and to furnish good drinking water to employees' dwelling houses. At the close of the year, the railroad owned 26 road and 11 switching locomotives, 5 special service cars, 8 first-class passenger coaches, 16 second-class passenger coaches, 580 box-cars, 136 coal-cars and 183 flat cars. Locomotive No. 14, a Rogers 4-4-0 was dismantled this year.

Good progress was made on the projected port and pier at La Boca in 1897, the work being done under contract with the Panama Canal Co., (the second French Co.). The expense was estimated at $427,000.00. Heavy rains in 1897 caused severe floods which required an increase of $61,930 in maintenance-of-way expenditures. The track was badly

P. R. R. #654, Brooks 1908, on main line, at San Pablo, looking south from old French diversion, Feb. 19, 1912.

P. R. R. #662 on Caledonia crossing, Panama City, 1930.

damaged and the embankments at Pariso, Matachin, Bas Obispo and Cucaracha had to be rebuilt as well as the abuttments and foundations to four bridges; on two of which the masonry had to be rebuilt. In 1897, the company overhauled every bridge from Colon to Panama, floors and paint being renewed on the majority of them. Twelve miles of road were ballasted, 16,987 crossties were laid and 166,082 feet of switch timbers were put in. To overcome the difficulties of low joints and weak fish plates, 9½ miles of track, where sharp curves or light rail had been laid, were laid with new angle plates. The new passenger station at Colon was finished and a complete rock-crushing plant established at Pedro Miguel.

The war with Spain, in 1898, seriously affected the company's business by causing almost a total suspension of passenger traffic and seriously impairing coastwise and foreign traffic. Despite this handicap, the directors decided to continue operating its steamships between New York and Colon and to pay the large premium asked for war-risk insurance. Fortunately there were no interruptions more serious than an occasional delay in sailing, and an enviable record was established. This was the only company with ships sailing under the American flag, between the United States and a foreign port on the Atlantic Ocean, which maintained regular service throughout the war and through the actual field of operations.

The new pier was completed in 1898. It was a magnificent affair, 1000 feet long and 50 feet wide, constructed on 24 solid concrete piers and covered over the entire length. Freight handling equipment consisted of five large steam cranes and a 15 ton derrick crane. The company had dredged alongside so as to permit free movement of vessels of 3000 tons at all times, allowing for stages of a tide that had an average rise and fall of 21 feet. The company built a large train yard, water plant for pier and ships, electric light plant, treasure vault, telephone and telegraph lines, track-scale, engine-shed and office buildings and, by March of 1899, everything was in readiness.

In 1900, the company conducted negotiations with Columbia, to induce that country to make formal declaration of its acceptance of the port and pier at La Boca in compliance with the terms of the original concession. With reluctance, the Government agreed, and a legislative decree of acceptance was published and approved. This took $10,000 annually out of Columbia's treasury that the Panama Railroad had been obliged to pay for the non-completion of this work.

The long standing and constricting contract of the Pacific Mail Steamship Co. expired in 1900 and an open-door policy was adopted by the Panama Railroad. Traffic agreements were executed with several lines on the Pacific and seven were renewed on the Atlantic side. The Pacific Mail Steamship Co. declined to make a contract save on an exclusive basis.

In 1900, seven locomotives were rebuilt in addition to those that received regular repairs. Further improvements were made—Bridge No. 15 was replaced with a new one of iron, all bridges were repainted,

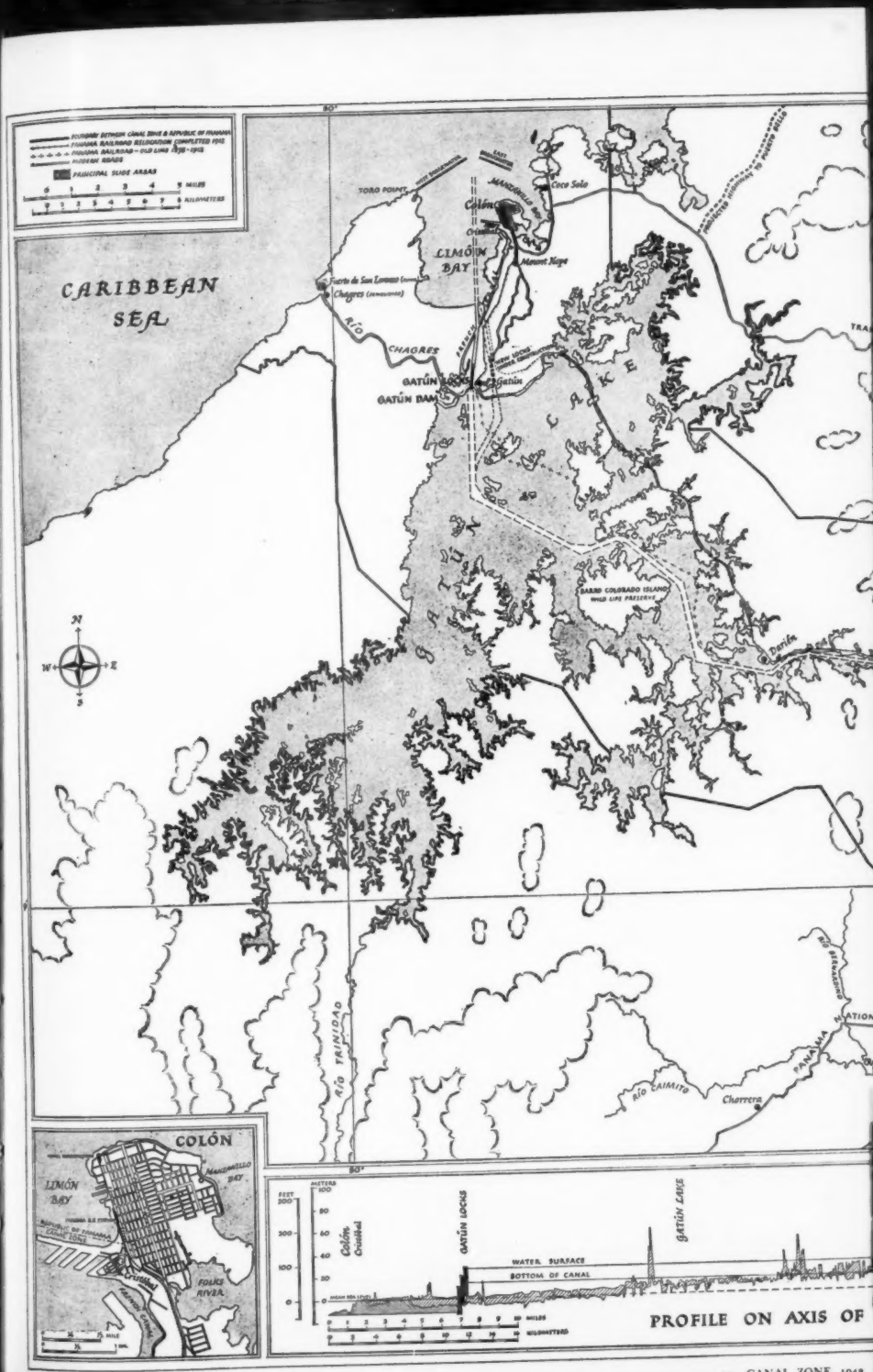
26,975 feet of drain tile were laid in cuttings, a new track 1000 feet in length was laid adjacent to the La Boca wharf, new angle plates between Corozal and Panama completed this type of improvement and three reservoirs at Ancon, Mt. Hope and Colon were enlarged.

In 1901 the Panama Railroad effected a lease with the French Canal Co., of the La Boca Branch R. R. and adjoining lands necessary for the operation of the terminal upon mutually satisfactory terms. As the result of the severance of relations with the Pacific Mail Steamship Co., a line of chartered vessels was established between Panama and San Francisco to hold the coastwise trade, but the cost of operating chartered vessels was so high, it would have been better to have built a line of new vessels.

This year the political situation was so grave that the United States landed troops to maintain free transit and to protect the company's property. This delicate task was discreetly and energetically performed by naval officers. It seems that the Columbian authorities for once were not after material gain and they worked with the U. S. Naval authorities to protect the railroad's property, which suffered no material damage. This situation, coupled with a prolonged labor strike in San Francisco and a big reduction in the coffee trade, severely affected the road's earnings but the times were extraordinary and made the best of its losses. Another deviation in the road, that at Culebra made necessary by canal construction, the cost of which was born by the canal company. The maintenance of track, bridges and buildings continued at a high standard with the cost being reduced as the line was improved. The company's port and terminal at La Boca were fully realized in 1902 when large ships were discharging and loading their cargoes right at the dock. New contracts were entered into between the railroad and steamship companies—the Pacific Mail Steamship Co., after some reconsideration, was to handle the traffic north of Panama while the Pacific Steam Navigation Co. and the Cia Sud Americanade Vapores would handle it south of Panama. This resulted, in 1902, of the Panama Railroad discontinuing the chartered steamship service between Panama and San Francisco.

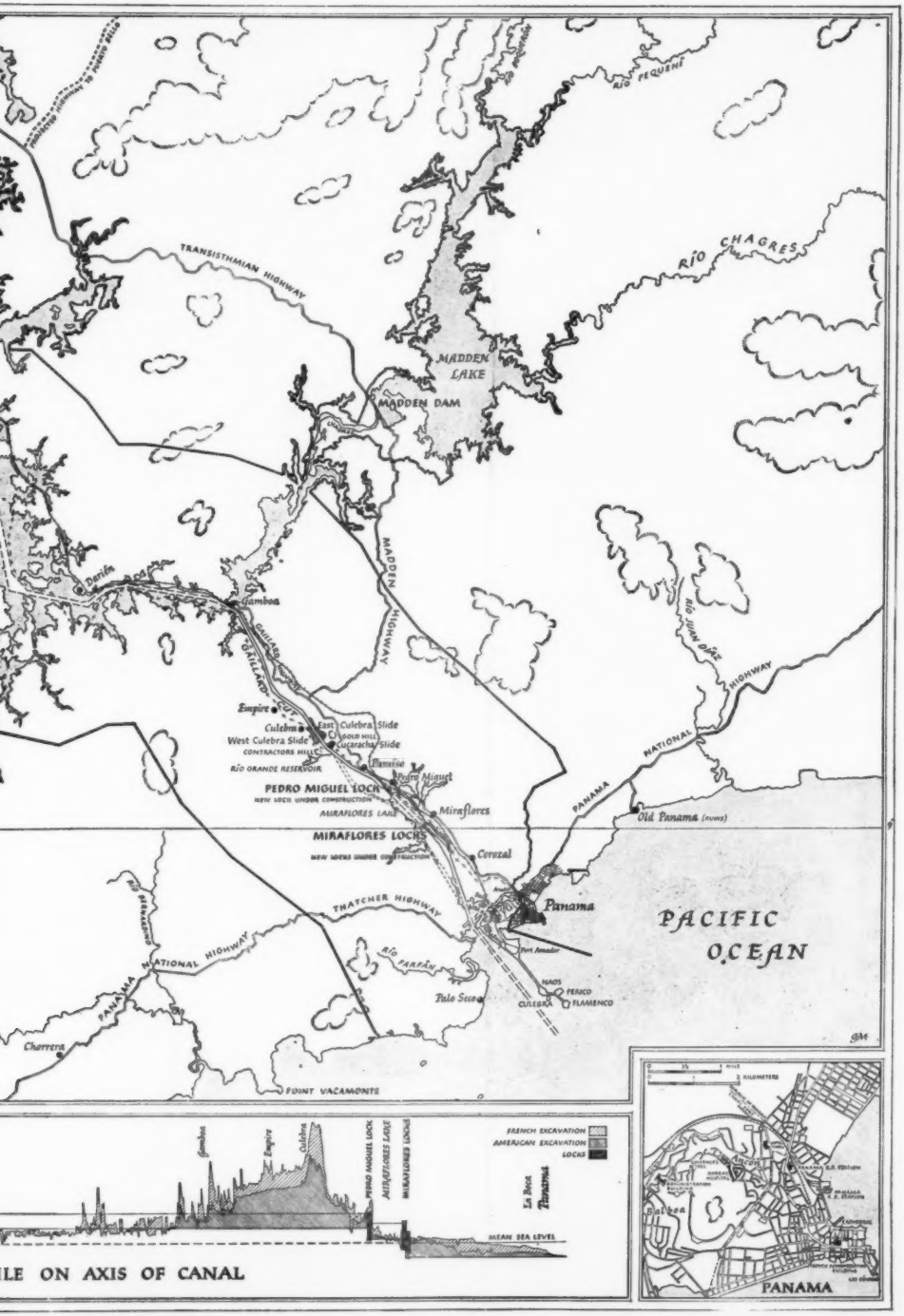
On November 3rd, 1903, the Department of Panama declared its independence from Columbia and became the Republic of Panama, which was formally recognized by nearly all the leading nations of the world. As the result, Columbia lost its sovereignty over the territory on which the Panama Railroad and its property was located and the new Republic of Panama took over Columbia's place in the contract of concession with the road. The new government notified the road that it assumed all of the former obligations of Columbia towards the road, which action was formally concurred in by the Panama Railroad.

In spite of later severe and, in the writer's opinion, unjustifiable criticism, the Panama Railroad did take care of its motive power, rolling stock and right of way. In 1903 eight locomotives were thoroughly repaired and all rolling stock was in first class shape. At the close of the year, just prior to the purchase by the United States Government,



17. CANAL ZONE, 1943

Coco Solo
Cristóbal
LIMÓN BAY
Mount Hope
Gatún
LAKE
BARRO COLORADO ISLAND
WILD LIFE PRESERVE
Río Caimito
Chorrera
GATÚN LOCKS
GATÚN LAKE
WATER SURFACE
BOTTOM OF CANAL
PROFILE ON



ILE ON AXIS OF CANAL

the road owned 24 road and 11 switching locomotives, 5 special cars, 8 first-class coaches, 2 composite first and second class coaches, 9 second-class coaches, 7 baggage cars, 584 box cars, 173 coal cars, 151 flat cars, 22 local express cars, 1 wrecking car, 5 cabooses, 2 specie cars, 9 water cars, 11 service cars and one steam shovel. In the latter part of 1903, the French Company's rights to build the canal were taken over by the United States Government and with them was included the Panama Railroad.

UNITED STATES OPERATION, 1903 TO DATE

The condition of the road at the start of the United States ownership was described by the chief engineer of the canal, Mr. J. F. Stevens, in 1905, as follows: "The Panama Railroad is practically nothing more than a right of way with a fair road-bed which has, however already proven unequal to the heavy traffic it was called to bear. It does not have the requisite number of sidings for handling either through or local traffic, and those in existence have reached the end of their lives, and will have to be rebuilt. Its rolling stock is limited in quantity, in capacity, and of an antiquated type, unsuited to the demands put upon it. From Colon to Panama not a single station is adequate to the requirements of the service, with no telegraph stations except at the terminals, and no lines over which a train order could be sent with any certainty that it would reach its destination inside of 24 hours."

There seems to be some prejudice in Mr. Stevens' statements on the condition of the road and its inability to take care of the work of the Isthmian Canal Commission, with the equipment taken over from the French. The writer has read everything dealing with the railroad from 1888 to 1904, including every annual report between those years and has interviewed old employees from the French company days. There is no mention whatsoever as to the removal of any of the telegraph stations and old employees state that there were thirteen telegraph stations in operation when the United States I. C. C. took over. Just why Mr. Stevens should have expected the Panama Railroad to be all ready for the I. C. C. to start right in, has never been made clear. The road was apparently able to handle all the business before, even with the extra work thrown on it by the French and, none of the records consulted by the writer indicate that the road was unable to handle its end of the work after it was taken over. To be sure, most of the motive power was 20 years old or more, but it would not seem to be too great an age for well maintained equipment and the short hauls that were made.

Despite the "inadequate" facilities of the railroad for the proposed work, it was kept going at full speed. As plans for the canal took definite shape, the railroad problem became clearer. There were two distinct problems; first, the rebuilding of the existing line to handle the enormous traffic made by the canal construction and second, to replace the existing road with a re-located line above the level of the proposed

lakes, all the while carrying on operations that could not be delayed without great loss to canal construction.

During 1906 and 1907 the work of rebuilding the road went ahead rapidly; the ties were all replaced, new rails were laid, bridges strengthened and all was made in readiness to handle heavier and more equipment. Stretches of track where the heaviest traffic was expected, as from Pedro Miguel to Panama and from Gatun to Camacho were double tracked. Spoil from Culebra Cut was used for this double-tracking, most of the widening being made with fill. By the end of 1907 this work was practically complete, save for ballasting and lining.

The traffic carried by the rebuilt railroad during the few years of canal construction was very heavy; the greater portion of the supplies being brought to Colon from whence they were distributed. All of the dry earth used in building Gatun Dam (still the largest earth-filled dam in the world) was hauled from Culebra Cut, 25 miles away via the railroad. The estimated ton-miles hauled for the relocation are as follows:

1904-05	17,000,000	1908-09	280,000,000
1906-07	42,000,000	1909-10	300,000,000
1907-08	150,000,000		

When the plans for a lock and lake canal were adopted, it became necessary to relocate the Panama Railroad. The old location from Gatun, to what is now Gamboa, was to be under 60 feet of water and it would be necessary to complete this relocation before final completion of the Cut and locks. Although the location of the original railroad was comparatively simple, following the natural contours through most of its length, the engineering problems of relocation were unique, it being necessary to bring the line to a certain elevation and keep it at or above this elevation. This required many fills up to and between Lion and Tiger Hills, more fills to the edge of the lake, through the edge of the lake to Gamboa, crossing the Chagres River at that point on a steel bridge and thence through a cut on a 40-foot berm to Pedro Miguel. From there it went by more fills across Miraflores Lake to a tunnel which was to be built through the hills back of Corozal, in a direct line to Panama.

The parts of the old line that were to be retained and made part of the final location was designated as "Permanent Lines." This designation was to be given to all parts of the re-location as they were completed and placed in operation. The designation between permanent and temporary lines, regardless of their momentary importance was necessary, for the standards of maintenance were different for each. One of the first new sections started was that between the tunnel and Panama. Then the canal plans were changed, moving the location of the lower Pacific locks from near Soca Hill to Miraflores, making this part of re-location unnecessary. Parts of the construction of this portion of the line had been done however, before the plans had been changed and cuts, fills and concrete culverts were left up in those hills with no apparent use.

P. R. R. #657, Brooks 1-908, crossing bridge 57½, across the canal, looking east, October 18, 1913.

P. R. R. Depot, Panama City, Jan. 1910. Main part of present station is about where first shelter shed is from the right.

As the canal work progressed, the relocation of the old road was started in the vicinity of the proposed locks at Gatun and Miraflores and pushed rapidly to completion at these points. The part from Mindi to Gatun offered no difficulties, there being no high fills or cuts required and was soon completed. The line from Gatun across the proposed lake at the high-level was a different story. Investigation of the several river bottoms to be crossed, disclosed the bearing power of the soil was insufficient to hold the weight of the high fills required and, solid rock in some places being 100 feet below the surface, it was obvious that to get these fills to solid rock would take so much excavation that it would be impossible to build them in the time allowed. Bridges and viaducts were considered, but maintenance under 60 to 70 feet of water was considered too much of a risk. So, this line was abandoned and another location sought. This was a combination of several that were submitted and was to cut from the old line at Mt. Hope and join it again at Quebrancha, thus saving several miles.

This plan was not accepted however, because it would leave Gatun on a spur, which for several reasons, some sentimental, and was not accepted. So, it became necessary to connect the permanent lines at Gatun with the old one, so that an operated line would be kept whole when the old line was cut to build the locks. This temporary connection was called the Tiger Hill line and was built on the same alignment as the first re-location, on a steep grade so that the high fills were soon reduced to a moderate height. The problem in removing the operated line from the location of the Miraflores Spillway, was the construction of the Miraflores Tunnel. The fills across Miraflores Lake were not nearly as high as those near Gatun (this lake being 30 feet lower). The foundation was much better and, with spoil much nearer, its completion took but little time. The tunnel was driven through the hills in schedule time, but after completion of the excavation and before the lining could be placed, excessive rains caused 200 feet of the south end to slip, twisting the timbers and stopping work until the following dry season. This end of the tunnel was completed in an open cut, and as soon as the lining had been placed, the tunnel was made a part of the operated line. The tunnel is 736 feet long.

The Gamboa Bridge was another of the earlier parts of the relocation to be built and was completed in 1908. The bridge was built this early to enable the canal commission's dirt trains from the Cut to reach new dumping grounds on the east side of the Chagres River and also to use some of the spoil in making the fills of the relocation. In order that this work could be carried out in as many headings as possible, a connection was made from the operated lines to the proposed location at Frijoles, and work started there. This change, though shortening the length over which it was necessary to build exceedingly high fills, did not lessen the height much, as the streams crossed had flat slopes. At the places of crossing, there were four streams, the Quebrancha, the Brazos, the Baja and the Gatun; all crossed within a distance of three miles. On all four of these fills, settlement trouble began as soon as

the upper section was filled, the settlement acting the same in all four cases, being accompanied by an uplift of the surface ground just outside the toe of the new fill, allowing it to sink. In the case of the Brazos fill, settlement was as much as 30 feet. To correct this condition, the bottom width was increased, in some cases it was necessary to make the slope five to one, instead of the original two to one.

As soon as there was reassurance that the relocated line from Gatun to Gamboa would hold up, it was placed in service and the old road from Gatun to Barbacoas was abandoned. This took place in 1913, the old line being kept in operation almost to the last day before being flooded out by the rising waters of the artificial lake. Most of the rails and ties had been in service only a few years and were good second-hand material, so most of them were taken up, but at times the race with the rising waters was very close. These materials were stored and later used for side and spur tracks. Mindi, which was important for its flood control location on the original road, was cut off the main line when it went to Gatun on the relocation. Mindi is now on a branch, some distance from the main line, and is the location of the Canal Zone Dairy.

A tentative place was offered by the I. C. C.'s first chief engineer, Mr. J. F. Wallace, at the beginning of canal construction, to change the gauge of the Panama Railroad from five feet to the standard 4′ 8½″. After careful study and consideration, it was decided that five feet seemed to work best, so nothing further was done about it, that gauge remaining up to the present.

As the Big Cut neared completion, slides developed and it became apparent that the proposed berm, (40 feet wide and 10 feet above the elevation of the water), while ideal for canal maintenance, was not a safe place for a railroad, it being quite possible for the railroad and the canal to be blocked by the same slide. To avoid this, the permanent line was placed on a new elevation, entirely removed from the cut and crossed the summit at an elevation of 271.47 feet. This elevation has been retained to the present day. This new line, called the Gold Hill line, leaves the old relocation at Gamboa and joins again at Pedro Miguel. Its construction started in 1910 and was completed in 1912, costing more than the country traversed would warrant due to the forced work necessary to complete it in the required time.

The once great bridge at Barbacoas was dismantled April 10, 1912. Three of the spans were used in building the bridge at Mt. Lirio, the other three are still stored at Corozal and seem to be in good condition. The contract for the construction of the Mt. Lirio Bridge was awarded April 24, 1912 to the Penn Bridge Co.

After the abandonment of parts of the old road that were covered by the lake, the operated lines on the west bank of the canal were isolated, except for a connection maintained across a dyke at Gamboa, which was left intact to prevent flooding the Cut before completion. There was also a trestle at Paraiso, and when the dyke was cut late in 1913, making the west side tracks a spur line, its only connection was this trestle. It was necessary to continue operation of this spur for

most of the important construction towns were located on it. After headquarters were transferred to Balboa, this line was kept in operation for the use of military forces on that side. (The name Balboa was given the town of La Boca on April 30, 1909). In order that this connection could be continued when canal traffic started, a pontoon bridge replaced the trestle. These lines were abandoned in 1920, thereby ending the original Panama Railroad with the exception of the short sections at the terminals.

After the work of relocation had been completed, it was found that there was only a difference of 200 feet in the net length, between the new road and that originally completed in 1855. In addition to the main line, the new railroad has numerous branches and isolated tracks where no regular operations are made, these being maintained for the delivery of supplies and other materials for the operation of the canal. The maintenance of these spurs is the responsibility of the maintenance force of the road but they are owned by the various departments of the Isthmian Canal Commission, the owners being billed for this maintenance.

The trans-shipping of freight and passengers across the Isthmus was carried on as usual during canal construction, and this business grew so large that, in 1910, it was necessary to limit the transfer of the bulky items, since it interfered with the canal activities. With the opening of the canal, the trans-shipping business dropped to almost nothing, but at the times of the slides, when the canal was blocked, most of the congestion was relieved by the railroad.

Up to 1943, the Panama Railroad was the only connection between Colon and Panama. The road was used by the Panamanian Government officials quite extensively, since Cristobal is usually a stopping point for most passenger vessels. It was, and still is, a fairly comfortable ride for those wishing to sail and see friends off. The Trans-Isthmian Highway was opened for traffic in April, 1943 and much local freight traffic was lost to the railroad upon its opening. Some of this loss was incurred by the railroad charging high rates for local freight. The greater portion of the passenger traffic, since the canal was completed, was the tourist travel which continued up to the late war and is commencing to return.

The Panama Railroad still operates under its original New York State charter, although any surplus, which ordinarily would take the form of dividends to stock holders, is turned over to the Treasurer of the United States. With the opening of the canal, the Panama Railroad ceased, (as of November 17, 1914) to be a common-carrier, hence it could no longer receive a proportion of a through rate for its share of the haul. It was not until June 10, 1921, that the railroad was permitted to charge any rate over the road, other than "local", on any cargo to and from ships. Restrictions were modified, so that a ship-to-ship rate, including hauling on the docks at both terminals, was available.

From September 1915 to April 1916, slides blocked the canal and during that period the railroad handled a large amount of tonnage be-

tween ships, not on a percentage through rate, however, but as so much per ton, depending on the class of cargo. With the re-opening of the canal since the slides, the importance of the Panama Railroad as a vital artery of world's commerce terminated, but not as a money-maker. What with having the commissaries and the ships travelling between New York and Cristobal among the most important parts of its business, the annual profit is larger than during the "gold rush days."

After its sale to the United States, the railroad lost its individuality, something that even under the French the road maintained to a certain degree. Since its acquisition by the United States, the road, together with the canal has had so much written about it, that the writer feels that it does not belong in this history. Nearly all of our libraries have considerable material on this subject so, with this short description given herein of the relocation, we will bring this account to a close.

(The story of the motive power and rolling stock of the Panama Railroad will appear in a subsequent article.)

ACKNOWLEDGMENTS

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All photographs and the maps that accompanied this article, were furnished by the author, from his collection.

Original Aurora Branch R. R. line as built through Aurora in 1850 (solid line A-B) and later revision (dotted lines) made at time of building of first shops and roundhouse in 1855. Super-imposed upon a recent aero-photograph of Aurora.

The Chicago, Burlington and Quincy Railroad Company

FEBRUARY 14, 1855—JULY 9, 1856

By A. W. Newton

The beginning of the Chicago, Burlington and Quincy Railroad dates back to the charter of the Aurora Branch Railroad, February 12, 1849, although the name dates from February 14, 1855, when the State Legislature passed an amendment to an act of February 28, 1854, which amendment says:—"the corporate name of the said Company shall be, and is hereby changed to the Chicago, Burlington and Quincy Railroad Company." This change of name was ratified at the Annual Meeting of Stockholders, February 21, 1855.

That this name had not been decided upon prior to or at the time of passage of the act of February 28, 1854, seems to be evident, for in that act it says:—"The name of said Company (Chicago and Aurora Railroad Company) shall be changed to that of the Chicago and Southwestern Railroad Company."

This act (February 28, 1854) was one of large import. The Forbes' interests had visualized, but not completed, plans for "a comprehensive plan for a system of railroads in Illinois."

At this time they were in full control of the Chicago and Aurora and Central Military Tract Railroads, the former completed (1853) and in operation and the latter nearing completion (completed, 1854). In addition, these interests, through financial aid, had large holdings in both the Peoria and Oquawka and Northern Cross Railroads, then nearing completion, with a view to eventual ownership.

Under this act (1854) authority was also given for the construction of a branch from its main line from the village of Aurora in Kane County, "to and into the City of Chicago by way of the village of Naperville." Thus early did they plan for an independent line into Chicago and abandonment of trackage contract with the Galena and Chicago Union Railroad between Turner Junction and Chicago. It was not until ten years later, however, May 20, 1864, that this branch was completed and opened for service when the Trackage Agreement of 1850 with the Galena and Chicago Union Railroad was terminated.

In the act of February 28, 1854, is a section that is most illuminating as to the plans of the Forbes' interests. It says:

> "The said company (Chicago and Aurora) and the Central Military Tract Railroad Company, the Northern Cross Railroad, and the Peoria and Oquawka Railroad Company, or any two or more of said companies, shall be and are hereby authorized to consolidate their stocks so as to form one stock and one company, and may assume the name of either as a common name, or may adopt such new name as the company may adopt, upon filing with the Secretary of State, a certificate under the corporate seal of the company of the name selected and its adoption."

The completion of the Aurora—Chicago Branch, and a consolidation of the four lines mentioned would give a through line from *Chicago*

Original Aurora Branch R. R. line as built through Aurora in 1850 (solid line A-B) and later revision (dotted lines), made at time of building of first shops and roundhouse in 1853. Superimposed upon a recent aero-photograph of Aurora.

to the Mississippi River with two western terminii, one at *Burlington* and one at *Quincy*. It was but natural and a practice generally followed in those days to use the names of principal terminii in assigning a name to a railroad, hence in this case, the adoption of the *Chicago, Burlington and Quincy Railroad Company,* as its name.

Nowhere in the records of the Company does there appear any statement to show why the name *Chicago and Southwestern Railroad,* as authorized in the act of February 28, 1854, was chosen, but it seems certain that at that time, the name *Chicago, Burlington and Quincy Railroad* had not yet been conceived.

February 14, 1855 an act amending the act of February 28, 1854 was passed by the State Legislature as follows:

> "Be it enacted, that section 2 of the said act be and the same is hereby repealed; and the corporate name of the said Company shall be and is hereby changed to the *Chicago, Burlington and Quincy Railroad Company.*"

Under the act of February 28, 1854 permitting the consolidation of these various lines, these companies, or any two or more of them were authorized to

> "adopt such new name as the company may adopt, upon filing with the Secretary of State a certificate under the corporate seal of the company, of the name selected and its adoption."

Some time between February 28, 1854 and February 14, 1855, the Company or Companies had chosen this name, which, with certain small changes has since been retained. These changes are herewith cited.

February 14, 1855, the name Chicago, Burlington and Quincy *Railroad* Company was authorized, which continued until July 9, 1856, when consolidation plans had been perfected. On that date, the name of the road was changed to the Chicago, Burlington and Quincy *Rail Road* Company. (Note the change *Railroad* to *Rail Road*).

It is an interesting fact that, while the Company complied with the provisions in the act of February 28, 1854, by filing "Articles of Consolidation" on July 14, 1856, five days after their execution by the railroads concerned, it was not until March 24, 1874 that the Secretary of State certified same. No reason appears in the records why this delay occurred, but it evidently became known to officers of the Company, and in order that provisions in the act be fully complied with, obtained the certification of the Secretary of State, over 20 years after filing of the "*Articles of Consolidation.*"

This name, Chicago, Burlington and Quincy Rail Road Company, continued to be used until June 24, 1864, at which time the ownership of the Peoria and Burlington Rail Road Company, successor to the Peoria and Oquawka Railroad Company, was acquired and consolidated with the Chicago, Burlington *and* Quincy *Rail Road* Company under the new, and present name, the Chicago, Burlington & (not *and* Quincy *Railroad* (not Rail Road) Company.

Concerning the Chicago, Burlington and Quincy *Railroad* Company (February 14, 1855 to July 9, 1856) Mr. W. W. Baldwin in his

"Documentary History" (1928) says:—"No additional road was built prior to its consolidation with the Central Military Tract Railroad Company in July, 1856."

There was, however, considerable activity of the Company along lines of developing the property and preparation for the future.

Baldwin says:

> "In May, 1855, the Company acquired a one-fourth interest in the St. Charles Air Line (extending from the South Branch of the Chicago River eastward to a connection with the Illinois Central Railroad on the lake front) jointly with the Illinois Central, Chicago and North Western (Galena and Chicago Union Railroad), and the Michigan Central, which line (St. Charles Air Line) was completed March 30, 1856. By contract of June 25, 1856, with the Illinois Central, this company, the C B & Q, acquired a terminal at the foot of Randolph Street in Chicago on the lake front, using the St. Charles Air Line to reach same."

At this time, 1856, the Galena and Chicago Union, which the "Burlington" had used, as a tenant, since October, 1850, from Turner Junction to Chicago, built a short connecting track from its main line at Harlem, now called Oak Park, to the main track of the Chicago, St. Charles and Mississippi Air Line Railroad, a road which it had just purchased and which afforded access to important terminal properties on the South Branch of the Chicago River, just north of North (16th) Street.

According to "Modified Contract" of June 28, 1856, between the Galena Road and the Burlington, the latter was given the right to use this route, which later came to be known as the South Branch Track of the Northwestern, to reach terminal property it had that year acquired at 16th Street and the river.

This marked the beginning of the Burlington's extensive terminals in Chicago, the history of which will be given elsewhere.

While the Burlington continued to run over the tracks of the Galena and Chicago Union Railroad Company until May 20, 1864, when its own line was completed into Chicago, its passenger, (with the exception of the local train between Aurora and Chicago) and freight business was withdrawn from the Terminals of that Company on the North Branch of the Chicago River at Kinzie Street, and handled in its own terminals at North Street and Stewart Avenue, and the terminal facilities of the Illinois Central Railroad Company on the lake front.

It was during this period (1855-1856) that the Company decided upon and built its Aurora Shops for repairing cars and engines, and in connection with same, built a realignment of track from the north limits of Aurora to New York and LaSalle Streets, in that city, abandoning that much of the original line of the Aurora Branch Railroad, for use as main line.

* * * * * *

FOOT NOTE:

It will be noted that in this historical sketch, reference is made to the act of February 28, 1854, under which the name of the Chicago and Aurora Railroad was changed to the *Chicago and Southwestern Railroad Company.*

While the Act became effective on that date, none of the roads mentioned took action ratifying same. Therefore, there is a hiatus between February 28, 1854 and February 14, 1855 in the chronoligic record of these roads, that later, by consolidation, became the *Chicago, Burlington and Quincy Railroad Company.*

Reference to minutes of directors' meetings shows that the various directorates continued to function during that period, and it was not until the "articles of consolidation" provided for in the Act had been effected February 14, 1855, did they cease to function.

These "Articles of Consolidation" combined the Chicago and Aurora, the Central Military Tract Railroads, thus forming the Chicago, Burlington and Quincy Railroad Company.

(Preceding papers by Mr. Newton have appeared as follows:

Bulletin No. 74—The Aurora Branch R. R. Co.
Bulletin No. 76—The Chicago & Aurora R. R. Co.)

Canada's Earliest Railway Lines

By Robert R. Brown

The Champlain and St. Lawrence Railroad, completed in 1836, is generally recognized as having been the first Canadian railway and it was the first to use steam locomotives but, if we simplify, the definition of a railway as a prepared roadway having two parallel rails to support and guide the wheels of vehicles, then we can carry the history back to a much earlier period.

1720—MINERAL ROCK TRAMWAY (1)

The earliest line of which we have any knowledge was a short tramway built in 1720, or shortly after, in connection with the building of the old French fortress of Louisburg, in Nova Scotia. Unfortunately not a great deal is known about it; contemporary French records are still preserved and were quite garrulous about such matters as the conversion of the Indians, the quarrels of petty bureaucrats and complaints about heavily padded expense accounts but they were strangely silent about many important things that would interest us to-day. The famous dry-dock, near Sackville, where the early Acadians repaired and wintered their fishing and trading schooners, is a good example of the difficulty of finding relible information. The dock can be seen to-day; indeed it could be used to-day if more conveniently located but no one knows when it was built nor by whom.

The Treaty of Utrecht in 1713, which awarded to England most of the coast of North America, including the former French possessions on the mainland of Nova Scotia and in Newfoundland, was a major disaster to the French colonial empire, as it gave England the means of blockading the only route to New France (Canada). France retained only Cape Breton island and, on the bleak and desolate shore of that island, the French commenced to build the supposedly impregnable fortress of Louisburg to guard the entrance to the Gulf of St. Lawrence. Most of the material for the building of the fortifications and the new city had to be brought from France or from other parts of Acadia or from New France but, at nearby Cow Bay, a coal mine was opened in 1720 to supply fuel for the city and a few miles back in the interior, where the Mira River flows through a beautiful, sheltered and fertile valley, the French established a number of fine farms, a naval dockyard, a brick manufactory and opened several gypsum quarries to supply the mortar and plaster needed.

A few years ago, the older inhabitants of the Mira Valley could point to the embankments and roadbed of an ancient tramway which, they thought, the French had built to bring gold down from the slopes of Mineral Rock Mountain, across an extensive swamp, to the river bank, and this story was corroborated by some of the older descendants of the original French "habitants". However, if any gold was found there, and that is doubtful, it could have been carried away in a miner's

pocket, and a careful examination of the site shows that the roadbed actually extends from the river, back to several very old gypsum quarries, which apparently have not been worked for nearly two hundred years.

Was it really a tramway or just a road? No documentary proof has been found but mine tramways were built in France at least as early as 1680, there was a pleasure railway in the gardens of the Chateau at Versailles in 1713, the best French engineers were employed at Louisburg, the surviving remains of the roadbed and the local tradition all point to the possibility and probability of the existence of this tramway from about 1720 until the destruction of the city following the second siege of 1758. The Louisburg papers, in the Public Archives of Canada, have not been completely examined and catalogued yet and it is possible that contemporary proof may be found eventually.

1762—THE NIAGARA PORTAGE INCLINE PLANE

At the close of the Seven Years War, the British military authorities were obliged to occupy the vast territory around the Great Lakes and to accept the surrender of the many French trading posts in that region and, a little later, they had to quell the Indian uprising led by the Ottawa chief Pontiac. In addition to troops, large quantities of ammunition and supplies had to be transported to the upper lakes. The rapids and falls of the Niagara River proved to be a serious obstacle and the old portage trail, used for many years by the French and by the Indian before them, was hopelessly inadequate and improved facilities had to be provided as quickly as possible.

The old portage extended from the "Lower Landing", now the town of Lewiston, upward through what is now the city of Niagara Falls to Fort Schlosser, about two miles above the falls, and it still exists throughout its entire length; bearing the names Lewiston Road, Main Street and Portage Road. It was fairly level except a very steep climb up the Niagara escarpment at the Lower Landing, and it was at this point that a rudimentary tramway or incline plane was built in 1762 and subsequently improved from time to time.

On September 20, 1762, Major Wilkins, the commandant at Niagara, reported to General Amherst,(2) "I have caused timber to be fell'd at the lower landing to build a log house—I have and shall employ part of the Independents (sic) till the Vessel sails, in making a Slope to the hill at that landing and have ordered a truck or Carriage to be made with runners to carry up 2 or 3 Barrels of provisions at a time, or a Batteau, which is to be hawled up by 2 or 3 men, by the use of a Cable & a large wheel, this will prevent the Barrels &c being wore to pieces on the Ground." Amherst told Wilkins(3) in reply that he was free to act according to his own judgment in the works he was carrying on. By the end of October "the Slope up the Bank at the Landing" was "now so far in order, that the Stores & provisions may be rolled up easy, which before were very difficult to do."(4) But this seems merely to indicate

that the grading had been finished and the freight was hauled up in rough wooden sleds. To prevent the runners from gouging into the earth, there must have been an arrangement of transverse logs, like a corduroy road, and probably two parallel rows of logs, like rails, to guide the runners of the sleds. There was no further reference to the tramway in this correspondence which continued until October, 1763. Perhaps it was built and then destroyed after the Devil's Hole Massacre of September 1763 but there is no record of this. It was not until 1764 that there was any account of work on the project—the journal of Captain John Montresor, of the Royal Engineers,(5) sent to Niagara to construct various redoubts along the portage. This journal was not as full as we should like but the following extracts indicate that he worked on some sort of an incline plane:

April 22d Received orders from Col. Bradstreet to proceed to Niagara carrying place, to fortify it, so as to keep up that Communication—

May 19th Sunday. Set off an hour before daylight and arrived at Niagara this night about 16 leagues left my detachment. Encamped at Johnson's Landing four miles to the Westward of the Fort.

May 20th Arrived the Detachment of Canadians which I left encamped at Johnson's Landing—

May 23rd Sent the Canadians their tents & Ammunition, 10 Barrels of Powder 100 lbs. each. Sent up Rope for the Cradles, the white rope rotten, also tools to the landing.

May 25th Set off 5 Batteaux for the landing with Naval Stores. I set off this day for the Carrying place. Reconnoitred the Ground & fixed on the place for the first Entrenchment to cover the cradles on the top of the Mountain. I imagine the Cradles will not answer the purpose intended; should they ever succeed in its construction as it must labour too much particularly the upper one.

May 26th The lower cradle broke down this day by which 14 Barrels of Provisions were lost in the River.

May 30th Proceeded at Daylight this morning—and established my Posts on the Portage, without any Interruptions notwithstanding the various reports. Arrived 2 light 6 pounders which I posted, one at the Camp Guard on a rising Ground fronting the woods & the other up on the Edge of the precipice to scour the Cradles, least the Enemy should make an attempt to destroy them.

June 3rd A party employed in assisting in finishing the cradles others in making a wharf of Log Work at the lower landing: others on Navy Island assisting the ship Builders.

June 20th Provisions crossed the Portage as before also 26 more Barrels of Powder & some Engineers stores chiefly entrenching tools. The 3 double Cradles & several Crabs or Capstans compleated. The upper cradle work'd & answers. Went over this day 302 Barrels of Provisions exclusive of ammunition & 552 Barrels have been carried over within these two days.

The hoist was referred to again the following year in the diary of Ralph Izard:(6)

July 22nd 1765 "Mr. Pfister, a German half-pay lieutenant of the Royal Americans, lives at Fort Schlosser. He has made a contract with General Gage, commander-in-chief, to carry all stores, batteaux, etc., belonging to the army, in wagons over land, about seven miles, the Falls of Niagara making the river of that name so rapid both above and below them, that it is absolutely necessary for everything going towards Lake Erie, to be carried that distance by land—Batteaux and all heavy baggage are raised to the top of an high hill on the river by means of a capstan."

Nineteen years later, the incline was still in use and Captain Gother Mann, R. E., reported:(7) "The Ways, Wharf, Cradle and Capstan want some repairs, which may be done for about £20-0-0." This was the last reference in the records of the Board of Ordnance. For twenty years after the close of the Seven Years War, both banks of the Niagara River were considered Canadian territory until the Treaty of Versailles in 1783 awarded the east side of the river to the United States. The British authorities did not relinquish control until about 1789, when a new portage road was built on the west side, from Queenston to Chippewa, through territory that has been Canadian ever since.

Available contemporary records do not give much information and do not say whether or not wheeled vehicles were used but the tramway was in use in one form or another from about 1763 until after the opening of the Erie Canal and it seems inconceivable that sleds could have been used for 60 or 70 years when wheels and rails would be such an obvious improvement. According to local tradition, cars with wheels were used almost from the beginning and it would be interesting to find some corroborating proof. Possibly there are other documents relating to this tramway in Albany or in the papers of General Gage, now preserved in the Clements Library in Ann Arbor, which would supplement the foregoing information which is derived entirely from British sources.

1823—QUEBEC CITADEL INCLINE PLANE(8,9)

To-day the walls and gates of Quebec city are little more than attractions for tourists and the citadel on Cape Diamond has no longer any military value except that the well-built barracks within it serve as the headquarters of one of Canada's most famous regiments, the "Van Doos."(10) When the fortifications were planned, in 1823, they were considered impregnable but within a few years from the time when they were completed, in 1832, it was realized that they were obsolete and of no practical value.

The summit of Cape Diamond is about 350 feet above the river and, to carry stone and other material from the wharf up to the top, an incline railway was built up the side of the cliff. There were two cars running on double tracks, one car going up loaded and the other descending empty. Power was supplied by a stationary steam engine. It was by no means a temporary contractor's hoist but was a permanent and well-built structure. During the building of the citadel and for years after, the general public were permitted to use it and it was finally discontinued, in the late forties, only because of its inconvenient location. Some years later, about 1880, a new elevator of almost identical construction was built at the east end of the Dufferin Terrace and is still in use.

1826—KINGSEY TRAMWAY

During the early years of the ninteenth century there was a prominent merchant in Quebec city named James George who, in origi-

nality of thought, was so far ahead of his time that many believed him to be insane and even his friends considered him eccentric. However, we now know that he was not only perfectly sane but extremely clever. At an early date he suggested certain extensive improvements for the Quebec harbour, which were ridiculed at the time, but were built many years later almost exactly as he had suggested.

He realized that the backwardness of the country was due to the lack of easy transportation into the interior; roads were few and, for the most part, were to be found only in the vicinity of Quebec and Montreal, and some of the richest and most fertile parts of the province were waiting to be opened up. In 1824 he presented a memorial to the government advocating the building of simple and inexpensive wooden tram roads where needed.(11)

NEW METHOD OF CONSTRUCTING RAILROADS

Take the rough trees of the forest, any kind of wood sufficiently large and firm will answer the purpose, groove or saw out about 1/4 or 1/5 the diameter for a track to run the wheels on; in which a shallow groove or cut must be made to receive a thin plate of hoop, bar or cast iron; or a flat surface to run a grooved wheel on. The logs which form the way are to be laid on cross pieces notched or tongued so as to admit of their being firmly fastened with a wooden pin; the logs to be of irregular lengths, that the joints may not be opposite to each other, this will render the work more solid; by the addition of Bays at suitable intervals, where a double Rail way cannot be afforded, to let the carriages pass, the necessity of which the double rail is obviated, or a side slope, rather inclining upwards, of sufficient length to take the Horses and Carriages clear out of the Rail until the other has passed by when by taking off the drag, the one that has moved out will return into the Rail Road without any great effort; entrances must also be left at various distances, where the ground is suitable to admit of carriages turning in; these entrances will also serve the purpose of passing bays in case of necessity. The spaces between the cross pieces are to be filled in lengthways, so as to make a firm path for the Horses, on the outside of the Rail when a pair of Horses are driven abreast, and in the middle between the Rails when a single horse is used; in meeting, the off Horse is shifted to the middle Road and the cross bar of the carriage or Wagon is also drawn in to clear the carriage in the Bay as one of its wheels may run on the same piece of Timber having a double groove. This method also admits of three Horses being driven abreast, when boats or heavy weights are to be transported; the width of the Rail Road is to be made suitable to the carriages of the Country where constructed, that is of such a width as to admit of carts or wagons of the usual construction passing upon it, and is also to be used in transporting Boats or Vessels overland by the assistance of a Steam Engine, or such other propelling power as it may be necessary to employ for that purpose on a double Rail Road, which is also to draw carriages over the said Rail

Road by means of an endless chain on rollers placed on the Rail, revolving up on the one side and down on the other, so that carriages moving in one direction may hook on, on the right, and those moving in the opposite direction, on the left, thus following the course of the chain which must be made to turn round on Iron Sheaves at the extremities of the Rails. Cradles whereon to take Boats on land are to be constructed by placing timbers of sufficient strength on crossbars of Iron, at the extremity of which cast metal wheels are to be placed to run on the rail; the number of Iron Axles and wheels being determined by length and weight of the vessel and her cargo; should more than two pair be necessary, crossbars at intervals whereon the Boat is to lie are to project beyond her sides wherein holes are to be pierced at the extremities for the reception of Bars or stantions which may be fixed therein according to the width of the Boat or Vessel for the purpose of holding it securely on the Cradle. When Keel Boats or Vessels having bearings are to be transported, fids or chucks of suitable dimensions, according to the size or mould of the Vessel to be transported, must be employed. The Cradles are to be placed under the Boat or Vessel whilst afloat, and the Rail Road being carried for a small distance into the Lake or River, the Cradle may be immediately drawn upon it which will supersede the necessity of employing cranes or other apparatus, which would otherwise be necessary to hoist up and place such Boats on the Carriage or Cradle.

Quebec 7th Dec. 1824.

Witness:

T. Tracy Thomas
D. J. Napier

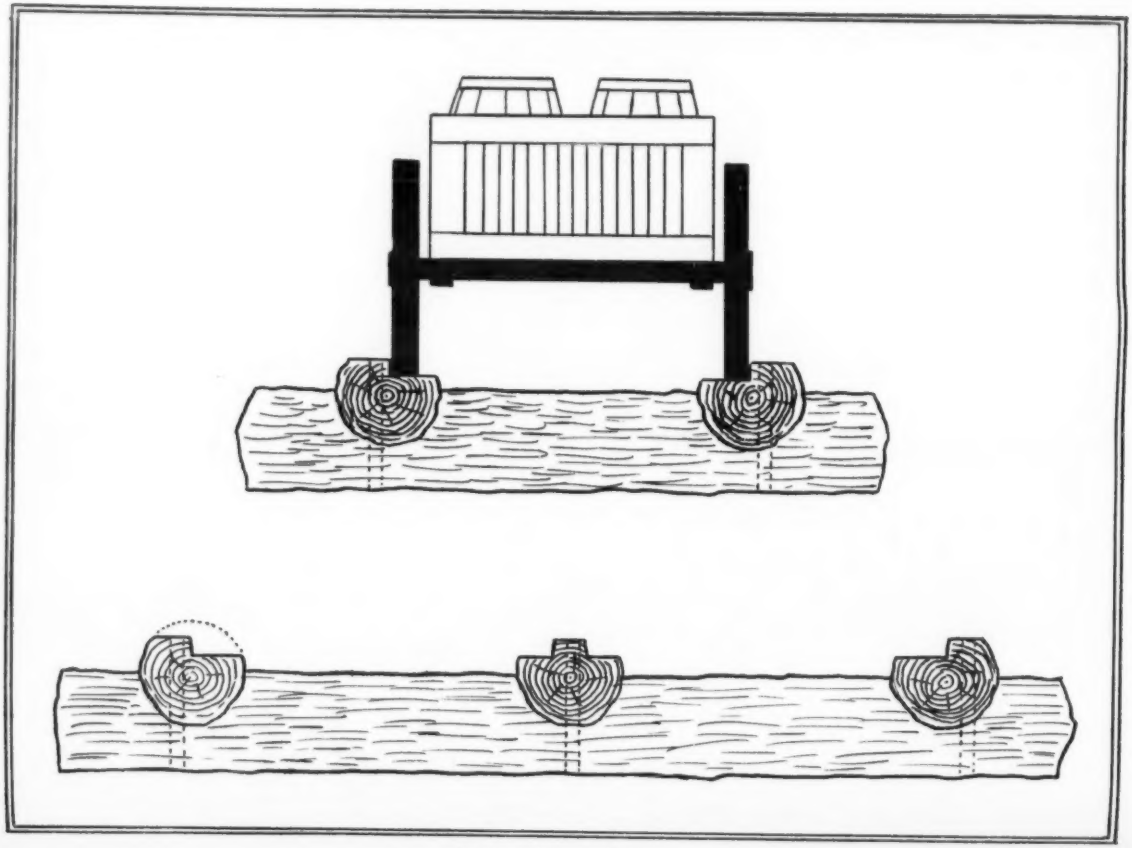
James George

Mr. George's plan obviously was based on the early English tram roads and, to some extent, by the Quebec Citadel Incline Plane but was so simple that any woodsman, accustomed to cribwork construction, could build such a railway with no other tools than an axe, an adze and an auger.

About that time, Mr. George was granted a large tract of land in the township of Kingsey, not far from the present town of Richmond, Que., and on this land he built a tramway on the plan outlined in his memorial. The exact date of construction is not known but is believed to have been in 1826 or 1827. It was referred to in an article in the Acadian Recorder of February 13th 1830:

> "It is suggested that, independent of iron ways, a very useful kind of wooden rail might be employed. An experiment of this description has been tried with success in the woods 120 miles from Quebec."

The exact location, likewise, is not known. Practically all of Kingsey township is rough and mountainous and unsuitable for farming and consequently the tramway must have been used in connection with lumbering operations. The only means of communication with the outside world was by the St. Francis River and, a recent examination of the area supports the belief that the tramway was built from a point



The James George Tramway

on the east bank of the river, about nine or ten miles below Richmond, and extended eastward into the forest, about four miles, to a point at or near the present village of St. Felix de Kingsey.

1827—RIDEAU CANAL TRAMWAY [12,13]

For many years after the War of 1812, the several unsuccessful attempts made by the United States to attack and invade Canada remained vividly in the public mind. It was thought that similar attempts would follow and, as Canadians were well aware of the vulnerability of the only line of communication between Lower and Upper Canada (Quebec and Ontario) by way of the St. Lawrence River, a longer but safer route was planned to go by way of the Ottawa River to a point just below the Chaudiere Falls and then by a canal to be built from there to Kingston, on Lake Ontario. Colonel By and a detachment of the Royal Engineers arrived at what is now the city of Ottawa, but known for many years as Bytown, in 1826 and commenced the construction of the canal. In the first few miles from the Ottawa River, a large number of locks and weirs had to be built and, to supply the necessary stone, a large quarry was opened at Hog's Back and a horse-operated wooden tramway was built in 1827 from the quarry along the canal bank to the locks at Nepean Point, a distance of about 5 miles. When the canal was completed in 1832, the tramway was abandoned.

THE GENERAL MINING ASSOCIATION [1,14,17]

In 1825, King George IV gave to his brother, the Duke of York, the exclusive right of mining in Nova Scotia for a period of 60 years, excepting, of course, grants that had been made previously to others. This rather arbitrary grant aroused a great deal of indignation in the province but, in the long run, it proved to be beneficial. The Duke's rights were soon transferred to the well-known London jewellers, Rundell, Bridge and Rundell, in settlement of his debts and they then organized the General Mining Association which introduced into Nova Scotia a wealthy and progressive company at a time when the capital, needed to develop the province's resources, could not have been raised otherwise. Operations were commenced immediately near Stellarton, in Pictou county, and at Sydney Mines and Bridgeport, on Cape Breton Island, and railway lines were built in connection with these mines.

1829—ALBION MINES RAILWAY [14,15,16,17]

Richard Smith, the agent of the General Mining Association, accompanied by a staff of engineers, mechanics and miners, arrived at Pictou on board the brig Margaret Pelkington on June 4th 1827 and the requisite mining tools and machinery made up most of the ship's cargo. A careful survey of the area was made and it was found that the most suitable place to win the coal was on the west side of the East River of Pictou, about half a mile north of the site of the present

station of the Canadian National Railways in Stellerton which, of course, did not exist then. Three large farms, owned by Dr. McGregor, William McKay and Colin McKay, and the mining rights owned by Adam Carr, were bought and several pits were sunk on the McGregor farm.

The East River was navigable for small vessels, drawing not more than 6 feet of water, up to the bend at Lourdes, which point was about 500 yards from the mines. At first the coal was carted to the river bank but this proved to be too costly and unsatisfactory so, in the summer of 1829, a horse-operated tramway was built from the pits to a wharf situated immediately below the cemetary at Lourdes. The rails were cast iron fish-belly type, three feet long, and resting in cast iron chairs which were spiked to wooden sleepers. These rails were made at the Albion Mines and, undoubtedly, were the first made in America. They certainly were the first metal rails made in Canada. When the Association commenced operations in Pictou county it was the intention of the directors to work the iron deposits known to exist several miles up the East River. A blast furnace was erected at the Albion Mines and the ore was quarried from an extensive bed near Springvale, 12 miles up the river. Actual smelting started in January 1829 and, in addition to the rails for the tramway, some excellent chain cables were made and, after 1835, several complete steam engines. The castings produced, in combined hardness and toughness, excelled anything then known but the demand for cast iron was small and the cost of carting the ore from Springvale so prohibitive that the work was given up gradually. Several lengths of these rails of 1829 are now preserved in the Provincial Museum in Halifax.

Large vessels could not ascend the river but anchored at the Loading Ground, below Dunbar Point, and the coals were brought down the river in lighters. In 1830, the Association built the first steamships in Nova Scotia; a small side wheel tug named the Richard Smith which was used on the river and in Pictou harbour and two much larger vessels, named the Albion and the Pocahontas, which were used to carry coals to Prince Edward Island, the North Shore and the Mirimichi.

The original wharf at Lourdes was unsatisfactory because of the shallow water in the late summer and autumn so, in the following year 1830, the tramway was extended downstream about 800 yards to a point about opposite the site of the present station of the Canadian National Railways in New Glasgow. This too proved to be unsatisfactory so, about 1834, the line was extended again to a point about 400 yards below the present bridge at George Street and there a large new wharf was built with coal pockets and chutes. Below Lourdes, the line was built on cribwork and piling along the river bank and all traces of it disappeared many years ago. The tramway probably was standard gauge, or perhaps 4′8″; there were passing tracks about every half mile and each horse went half a mile with a train of loaded chaldron wagons downward, leaving them on the main line for the next horse to take on, and returned with empty wagons from the siding. In addition

to the two miles of tramway along the river there were about two miles of tracks down in the mines. Fifty horses were regularly employed on the tramway above ground and between 50 and 60 below.

As this method of transporting the coals was slow and expensive, the Association decided in 1834 to build a locomotive railway from the pits to a new loading pier to be built at Dunbar Point, near the mouth of the river, where the coals could be dumped directly into the holds of the largest vessels. Surveys for the new line were made by Peter Crerar, who should be recognized as one of Canada's railway pioneers. He was born in Breadalbane, Scotland, in 1785; he came out to Nova Scotia in 1817 and died there in 1857. At first he taught school but, being a man of unusual intelligence, he became a government land surveyor and Commissioner of Crown Lands, in which latter capacity he laid out many of the roads in Pictou county. Crerar had never seen a railway and when his plans and profiles were sent to the Board of Directors in England for approval, they were accompanied by a request that an experienced engineer be sent out to supervise the building of the railway. The plans were submitted to one of the foremost engineers in England and, on his recommendation, the directors wrote to their agent, Richard Smith, "What need is there of our sending you an engineer when you have Mr. Crerar in the country? Let him supervise the construction."

The building of the railway started in the spring of 1836 and, as it was higher up the bank and farther away from the river, the old tramway was not disturbed and continued in use until the new line was completed. The country through which the new railway passed was very hilly but the line was kept very straight and almost level. Fills and cuttings were very heavy, amounting to 400,000 cubic yards, and had slopes of 1½ to 1 and a roadbed with a uniform width of 18 feet.

There were numerous arch top box culverts, of red sandstone, many of which are still in use and in perfect condition. Curvature was reduced to a minimum, even if it involved additional cutting or filling, and the least radius of any of its curves was 1300 feet. The few slight gradients favored the loaded trains in most cases; starting from the mines there was a falling grade of 1 in 437 (0.2%) for a distance of 1167 yards; then practically level for 6257 yards; then a slight rise of 1 in 578 (0.18%) for 833 yards; succeeded by a level stretch for 1937 yards; and then a down grade of 1 in 360 (0.27%) for 500 yards to the wharf at Dunbar Point. This place was named South Pictou and the line was sometimes known as the South Pictou Railroad although it was more commonly called the Albion Mines Railway. The wharf at South Pictou was 1600 feet long, 24 feet wide and commanded a fall at the chutes of 17 feet above high water.

The old cast iron rails, made in 1829, were not thought to be strong enough to support the weight of locomotives so the new line was laid with wrought iron bull head rails which rested in cast iron chairs and were secured in place with iron wedges. A short length of one of these rails, with two chairs and wedges, may be seen in the Chateau de

Ramezay Museum in Montreal. The Association employed on the construction of the railway 262 laborers and drivers, 20 masons, 3 blacksmiths, 11 carpenters and 102 horses. The total cost of the line was £40,300-0-0 (approximately $195,000.00 or $32,000.00 per mile fully equipped).

A short portion of the line, near the mines, was completed in the autumn of 1838 and, before the end of the year, three locomotives were received from England. One of them, the "Samson", was set up and tested in December 1838 but they were not used regularly until the following summer. George Davidson, who came out to set them up, was the first engine driver and later became Mechanical Superintendent. He was a typical Scottish engineer and was wont to say that he took better care of his engines than he did of his guid wife. David Floyd was the first fireman and later engineer and Patrick Kerwin was the first brakeman. The brakeman had a very difficult and dangerous job as the brakes consisted of short lengths of chain, attached to the frames of the wagons, with hooks which were hooked to the spokes of the wheels of the moving cars.

The first passenger carried on the line was Kerwins little daughter Margaret. Just before the start of the first trial trip of the "Samson", Kerwin snatched up his little girl and lifted her aboard saying, "Maggie shall have the first ride to make her remembered in the land."

The official opening of the line took place on September 19th 1839 and was an event that was long remembered. The steamboats Albion and Pocahontas, each towing several barges, brought about 2000 people over from the town of Pictou and several thousands more came on foot or in carriages from the surrouding country. Bands played, there were parades; a train of chaldron wagons carried visitors up and down the railway, giving all but a few of them their first train ride; and, best of all, there was a gargantuan feast at the mines. A large brick oven was built, large enough to hold the carcass of an ox which was stuffed like a turkey, and barrels of melted butter were used for basting. Half a ton of beef and mutton was used to make stew and corresponding quantities of other food was consumed.

Shortly after the line was completed, a small passenger coach was built at the mines to carry company officials and important visitors and fortunately, through the foresight of the Baltimore and Ohio Railroad, it was saved from destruction and is still in existence. It was exhibited at the Fair of the Iron Horse in 1927 and at the New York World's Fair in 1939 where it was featured as the Nova Scotia Coach. In the early days it was known as the Bride's Coach because one of the first passengers carried in it was the bride of the governor of the province. From that arose the local legend that if a young girl could sit in the coach perfectly still and not speak for twenty minutes, she would be married within a year. But, of course, a girl who could remain silent that long would have no difficulty in finding a husband.

The exclusive monopoly of the General Mining Association was abolished in 1856 but it was permitted to retain certain properties in Pictou county and in Cape Breton Island, which were being worked at

the time. Later, in 1872, the Association decided to concentrate its efforts in the Cape Breton area and consequently the mines in Pictou county were sold to the Halifax Coal Company. Meanwhile two other companies opened mines near the Albion Mines. The Acadia Coal Company opened a mine at Westville and, in 1867, built a railway from Westville to a connection with the Intercolonial Railway at Stellarton, secured running rights over the Intercolonial from Stellarton to Pictou Landing and built another line from Pictou Landing to Moodie Point, where a large loading pier was built. To the east of Albion Mines, the Vale Coal, Railway and Manufacturing Company opened a mine and, in 1872, built a railway from the mine at Thorburn to a connection with the Intercolonial Railway at New Glasgow. Like the Intercolonial, the Acadia and Vale railways were broad gauge (5'6") but were changed to standard gauge in 1875. In 1885 the Halifax Coal Company, the Acadia Coal Company and the Vale Coal Railway and Manufacturing Company amalgamated under the name Acadia Coal Company and this company is still operating the mines.

The Acadia Pier at Moodie Point was much more convenient than the old General Mining Association Pier at Dunbar Point, especially for sailing vessels, and, shortly after the amalgamation, the lower part of the Albion Mines Railway was abandoned and subsequent deliveries to ships were made at Moodie Point. Parts of the old line are still in use to-day; from a connection with the Canadian National Railways near Stellarton down to George Street, in New Glasgow, where there is a coal pocket for local deliveries, and also a branch from Lourdes to the Back Mines. The Pictou Landing branch of the Intercolonial Railway was built in 1867 and passed within a few yards of the Albion Mines Railway but, because of the difference in gauge, there was no physical connection until 1875 when the Intercolonial was changed to standard gauge.

ALBION MINES RAILWAY

LOCOMOTIVE ROSTER[18]

Samson	0-6-0	15½ x 18	48"	1838	Timothy Hackworth, New Shildon
Hercules	0-6-0	15½ x 18	48"	1838	Timothy Hackworth
John Buddle	0-6-0	15½ x 18	48"	1838	Timothy Hackworth
Vulcan	2-4-0	15 x 24	60"	1848	R. B. Longridge & Co. Bought second hand in 1853.
Albion	0-6-0	15 x 24	48"	1854	Rayne and Burn
Pictou	0-6-0	15 x 24	48"	1854	Rayne and Burn
Sir George Elliot	0-6-0	15 x 24	48"	1880	Black & Hawthorne #556
Stellarton	0-6-0T			1867	Dickson Bought second hand about 1885; probably 2-6-0 type originally.
No. 9	2-6-0	18½ x 26	57"	1875	Baldwin Ex Vale Railway no. 1, acquired by amalgamation in 1885.
10	2-4-2T	17 x 24	50"	1904	Baldwin
11	0-6-0	18 x 24	50"	1896	Pittsburgh Formerly Pittsburgh and Lake Erie R. R. no. 9116, bought in 1922. Originally 2-6-0 type.
103	0-6-0	17 x 24	48"	1911	? Formerly Cook Construction Co. no. 103

The Samson is still preserved in Halifax; the John Buddle was scrapped in 1885; the Vulcan and the Pictou in 1886; and the Hercules in 1892. The Albion was preserved in Halifax and was last reported as stored at Stellarton. The Sir George Elliot was sold to the Maritime Bridge Company, in New Glasgow, and was scrapped in 1925. The Stellarton was sold, in 1887, to the Cumberland Coal and Railway Company as no. 3 and was scrapped in 1911. No. 9 was scrapped in 1918. Nos. 10, 11 and 103 are still in service.

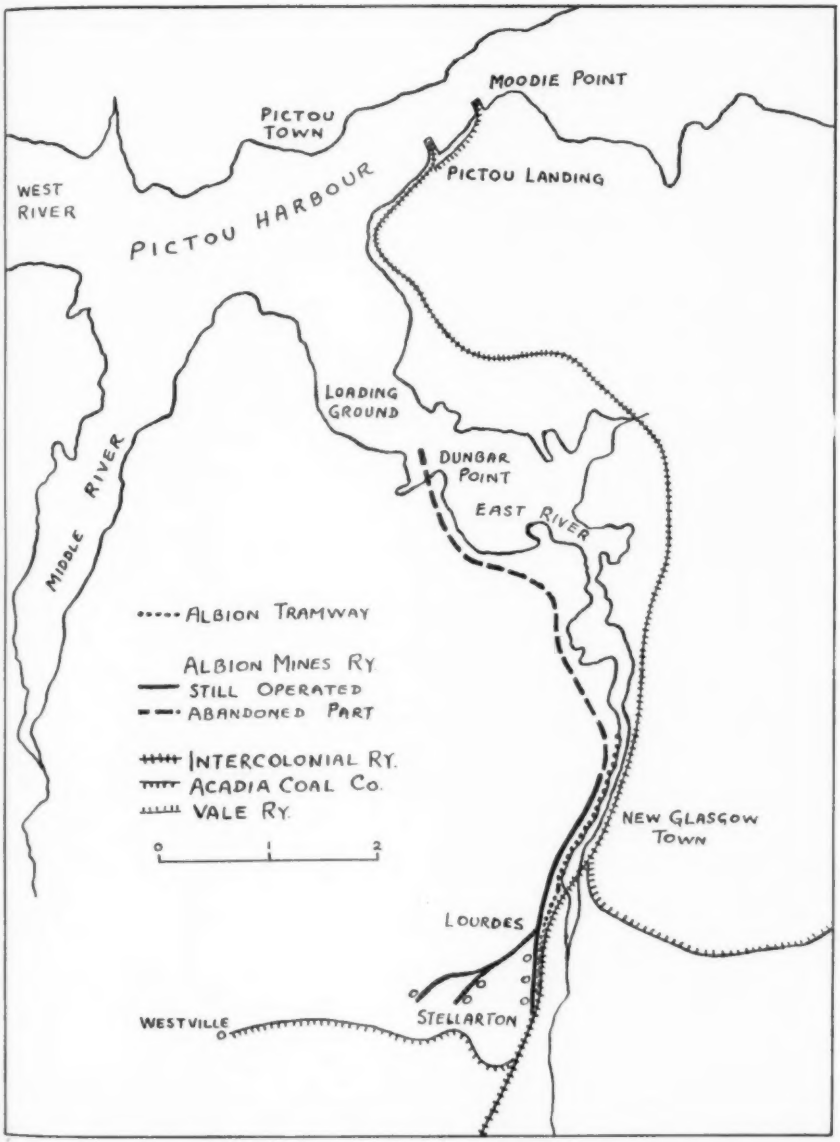
1830—SYDNEY MINES RAILWAY [1,17]

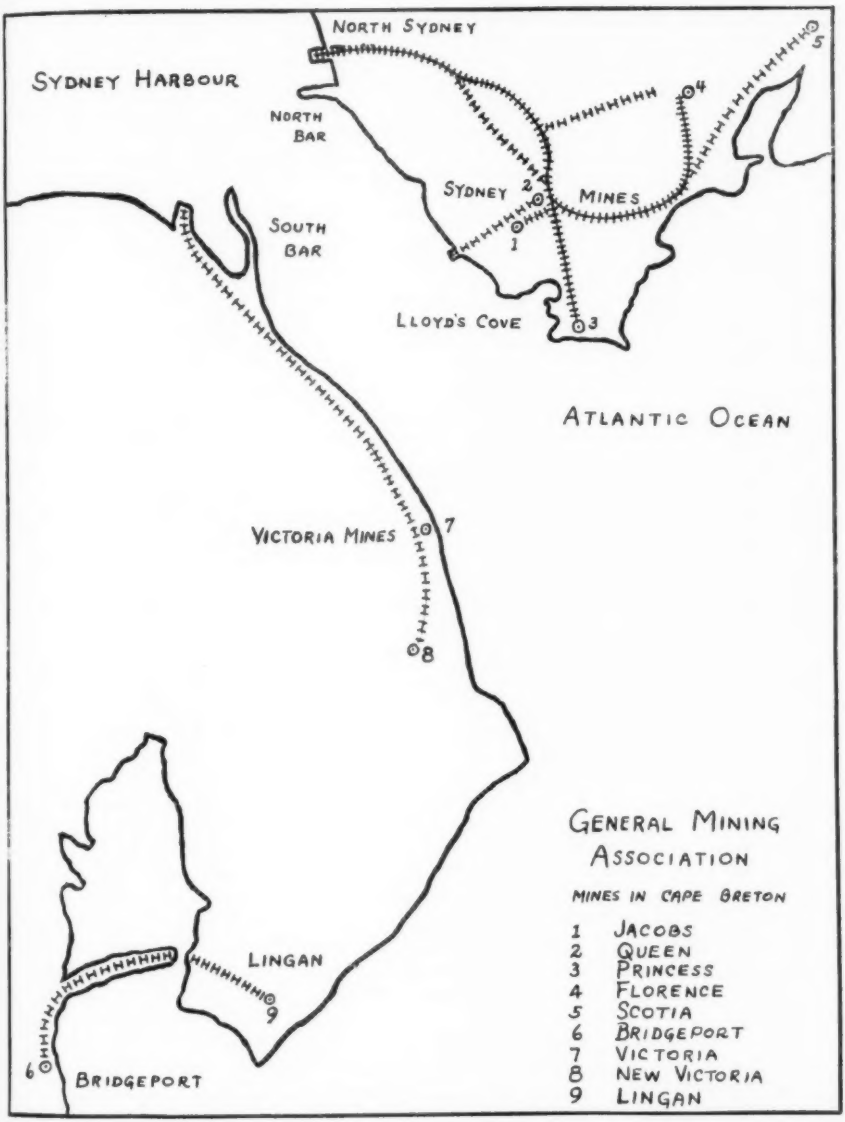
When the General Mining Association commenced operations in Cape Breton in 1826, it was found that the best mining properties had already been leased to Messrs. T. S. and W. R. Bown and consequently were not included in the rights granted to the Association. However the Bown lease was due to expire at the end of the year and, as the operations had reached a stage where the erection of expensive machinery was necessary, the lessees were not disposed to seek a renewal. The General Mining Association took over these mines on a temporary arrangement on January 1st 1827 and by a permanent lease a year later.

Originally the Sydney Main Seam was opened by driving an adit or level into the cliff from the shore at the old wharf and, as the workings advanced, shafts were sunk from the surface at intervals of about 200 yards. The coal was hauled to the bottom of the nearest shaft in two-bushel tubs carried upon small iron-shod sledges over a roadway of small round poles laid transversely and close together. There these small tubs were emptied into larger tubs which were then raised to the surface by a double horse gin and the coal emptied into an elevated hopper. From the hopper, the coal was loaded into two-wheeled carts which were driven over a corduroy road to the wharf. The original wharf was outside the bar and, as it was exposed to the Atlantic swells, it could be used only in calm weather and even then vessels drawing more than 10 feet of water had to receive their cargoes from lighters.

In 1830 the Association sank a new shaft 250 yards north-east of the old workings and a light temporary railway was built from the pits to the old wharf, pending the completion of a substantial line to a secure place of shipment inside the North Bar. In 1834, a new shaft known as the Jacobs Pit was sunk 400 yards further to the dip and a railway, 3 miles in length, was built from the mine to the new pier at North Sydney. Horses hauled the chaldron wagons from the mines up a gradual incline to the summit of a low ridge, about half way, and then the cars were "dillied" down the hill to the pier. Special "dandy" cars were attached to each train to carry the horses on the downhill part of the trip. The horses were fine, well-trained animals; the uphill climbs were not severe and old-timers[20] relate how obviously the "Hay-burners" enjoyed the rides downhill.

In 1836, before he even began to think about trans-atlantic steamships, Samuel Cunard, a coal merchant in Halifax, was appointed Sales Agent of the General Mining Association and he commenced to advertise the convenience of the recently built shipping facilities at North Sydney[19]:


MOODIE POINT
PICTOU TOWN
PICTOU LANDING
WEST RIVER
PICTOU HARBOUR
LOADING GROUND
DUNBAR POINT
EAST RIVER
MIDDLE RIVER
ALBION TRAMWAY
ALBION MINES RY
STILL OPERATED
ABANDONED PART
INTERCOLONIAL RY.
ACADIA COAL CO.
VALE RY.
0
1
2
NEW GLASGOW TOWN
LOURDES
STELLARTON
WESTVILLE


NORTH SYDNEY
SYDNEY HARBOUR
NORTH BAR
SYDNEY MINES
SOUTH BAR
LLOYD'S COVE
ATLANTIC OCEAN
VICTORIA MINES
LINGAN
BRIDGEPORT
GENERAL MINING ASSOCIATION
MINES IN CAPE BRETON
1 JACOBS
2 QUEEN
3 PRINCESS
4 FLORENCE
5 SCOTIA
6 BRIDGEPORT
7 VICTORIA
8 NEW VICTORIA
9 LINGAN

The line of railway at the Sydney Mines, having been completed from the Pits direct to the North Bar, vessels can now load in all kinds of weather, without any risk of being detained as heretofore—the wharf being situated within the bar, is effectively protected from sea swell and the depth of water alongside is sufficient for vessels of the largest class—mooring buoys are placed at suitable distances from the wharf for the convenience of vessels, and there are berths for three vessels to load at one time. The coal is brought direct from the pit to the wharf, a distance of 2¾ miles, by railway and is discharged from the wagons directly into the hatchways of the vessels. 500 tons can be shipped in one day, and the coal being passed over screens into the wagons, is delivered to the vessels free of slack. Vessels can land their ballast and take in their cargo at the same wharf.

S. CUNARD

Incidentally, the old firm of S. Cunard & Co., is still the principal coal distributor in Halifax.

In 1854 the Jacobs Pit was lost due, it was said, to a heavy influx of water but the truth of the matter was that on the evening of December 31st 1853 Stephen Curry, who was in charge of the pumps, went out with some of his pals to celebrate Hogmanay at a dance at Mrs. Farley's inn at Murray's Corner. Unfortunately he got soaked in West Indies rum and when he returned to the mine in the wee sma' hours the pumps were silent and submerged. Something had happened over night to the machinery and the pit was lost. Curry was fired at dawn! A new mine, known as the Queen Pit, 450 yards from the Jacob, was hurriedly brought into operation and the railway extended to it. Two locomotives were brought out from England and the line was re-located for about a mile to eliminate the summit.

In 1865 the Association commenced to sink a new pit near Lloyd's Cove in order to work five square miles of submarine areas acquired by lease that year and the railway was extended to the new pit. However the pumps were unable to cope with the extremely heavy flow of water and the work was abandoned for a time. Three years later it was decided to sink a mine at Cox Hill (now Florence) but, after completing the grading for a branch of the railway, this project was abandoned. In 1875 John Elliot was sent out as Chief Engineer and one of his first tasks was to try to save the new mine at Lloyd's Cove. By lining the shaft with special sectional cast iron segments he was able to stop the leak and the mine was opened in 1876. At first it was known as the New Winning but the name was soon changed to Princess Colliery and, after many years, it is still producing the famous Old Sydney coal. The shaft is practically on the sea shore and some of the workings are now more than five miles out under the sea. It is said that, some years ago, while a ship was sinking several miles off shore, the miners below were requested to listen for the thump of the ship striking the bottom so that, when salvage operations were undertaken later on, the submerged wreck could be located without difficulty.

In 1900 the General Mining Association sold all its properties in Cape Breton to a Canadian company, the Nova Scotia Steel and Coal Company. The railway was extended to a new mine at Florence and later on, about 1916, a branch was built to the Scotia mine near Little

Bras d'Or. About 1920, the Nova Scotia Steel and Coal Company, the Dominion Steel and Coal Company and several others joined to form the British Empire Steel Corporation which has since resumed the older name Dominion Steel and Coal Company. The properties at Sydney Mines and North Sydney were acquired by a subsidiary company, the Old Sydney Collieries Ltd., which is the present operating company.

The Sydney Mines Railway of the General Mining Association was probably the first in the world to use telephones for train dispatching[21]. Gardiner G. Hubbard, father-in-law of Alexander Graham Bell, was one of the principal owners of the Caledonia mine at near-by Glace Bay and in August 1877, while on a visit to inspect the mine, he brought with him two of Bell's newly invented telephones. One was placed in the underground workings and the other in the bankhead and they proved to be very successful and very useful. Hearing about this, the General Mining Association ordered five telephones and they were installed and used for the first time in October 1878. One was in the general offices, one in the stores department, another down in the Princess Colliery, one in the railway office and roundhouse and the fifth was in the shipping pier office at North Sydney and, from that day to this, the movements of trains have been dispatched by telephone.

Most of the Sydney Mines Railway is still in use.

SYDNEY MINES RAILWAY

LOCOMOTIVES

	Halifax	0-6-0T	12 x 20	60"	1854	Builder unknown
	Sydney	0-6-0T	12 x 20	60"	1854	Builder unknown
	Stephenson	0-4-0T	10 x 18	43"	1872	Robert Neilson & Co.
	John Bridge	2-4-0T	15 x 23	60"	1872	Fletcher, Jennings & Co.
	C. G. Swann	0-6-0T	14 x 23	58"	1885	G. M. A., Sydney Mines Used on the Victoria Mines Railway of the Low Point, Barrasois & Lingan Mining Co., a subsidiary of the General Mining Association.
5		4-4-0	16 x 21	61"	1859	Robert Neilson & Co. Originally Intercolonial Railway no. 19; bought in 1875 by the Nova Scotia Coal Co., of Westville; brought to Sydney Mines in 1900.
6	Fairy	0-4-0T				Narrow gauge, 3'6"; used on the Lingan Railway of the Low Point, Barrasois & Lingan Mining Co.
7	J. D. Hill Re #24 in 1920	2-4-0T	16 x 24	52"	1894	Baldwin Sold in 1928 to the Victoria Coal Co., at River Hebert, N. S., Scrapped 1934.
8	E. E. Bigge Re #25 in 1920	2-4-0T	16 x 24	52"	1900	Baldwin
10	Simon A. Fraser Re #17 in 1920	2-6-4F	19 x 26	50"	1902	Schenectady Rebuilt as a 2-6-0 type.
11	Senator McGregor Re #26 in 1920	2-4-0T	16 x 24	52"	1905	Baldwin Rebuilt as a 2-4-0 type.
12	John F. Stairs Re #27 in 1920	2-4-0T	16 x 24	52"	1905	Baldwin Rebuilt as a 2-4-0 type.

13	Harvey Graham	0-8-0T	17 x 22	41"	Andrew Barclay & Co. Crane locomotive. Retired about 1920 and scrapped in 1930.	
14	Robert Harris	0-6-0	19 x 26	50"	1911	Montreal Loco. Works #50017

Nos. 25, 26 and 27 are still in service and other locomotives are borrowed, when needed, from the Sydney and Louisburg Railway.

1830—BRIDGEPORT TRAMWAY (1,17)

In 1829, the General Mining Association opened a small mine at Old Bridgeport, now in the town of Dominion, by driving a level into the cliff from the beach and, in the following year, a light horse-operated tramway, about two miles long, was built from the adit along the beach on the south side of Indian Bay and along the sandbar to the gap at Lingan, on the north side, where a small harbour was made. The mine and the tramway were abandoned in 1849 and few traces remain.

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Special acknowledgements are due to Mr. Gustav Lanctot, Deputy Minister of the Public Archives of Canada.

The Railroads of McKean County, Pa.

By C. F. H. Allen

(This is the second in a series of articles on the railroads in this section that commenced in our Bulletin No. 76).

BRADFORD, ELDRED AND CUBA

The Bradford, Eldred and Cuba Railroad Co. was a 3-foot gauge railroad located in the Allegany (New York) oil district, extending from Cuba southwards to Eldred in Pennsylvania, near Bradford. The route passed through Little Genesee; at the latter point a connection was made with a subsidiary, the Wellsville, Bolivar & Eldred RR, thus affording a connection with Wellsville. The route selected, in part following the Allegheny River, crossed the state line three times. The short section, which lay in the state of Penna. is described in Poor's Manual for 1882 as the Bradford, Eldred and Cuba RR of Pennsylvania.*

At its greatest extent, including its leased lines, the Bradford, Eldred and Cuba Railroad totaled 53.69 miles. At one time, jointly with the Bradford, Bordell and Kinzua, through trains were operated (though with a change of engines) between Bradford and Wellsville, a distance of 56 miles.

The Bradford, Eldred and Cuba connected with the New York, Lake Erie and Western Railroad at Wellsville. This large road, which later became a part of the present Erie system, was greatly interested in reaching the oil fields of both New York and Pennsylvania by a direct connection. On Mar. 12, 1883, it entered into a contract with the BE&C similar to that with the Tonawanda Valley and Cuba, and with the Bradford, Bordell and Kinzua; the details of the arrangement are given under the latter road (p. 73). By the terms of this contract the NYLE&W obtained virtual control of the small road for a few years.

The Bradford, Eldred and Cuba Railroad itself consisted of 23.71 miles between Cuba and Ceres in New York. Of the two leased lines, the Wellsville, Bolivar and Eldred extended from Wellsville to Little Genesee, with a branch of 1.93 miles from Bolivar to Richburg, all in New York state, and totaled 20.62 miles. The Bradford, Richburg and Cuba covered the 9.36 miles between Eldred, Pa., and Ceres, N. Y., 3.62 miles of which lay in the state of New York.

The Bradford, Eldred and Cuba Railroad Co. was chartered on May 11, 1881, with a capitalization of $175,000. Its most famous stockholder was President U. S. Grant.

* These small lines were all built and operated prior to the regulations of the Interstate Commission. The lines in one state were a corporate undertaking subject to the laws of that state; if they extended into adjoining states they were usually incorporated in such states, often by a different or slightly different name, although they were practically the same company or group of owners.

The officers were:

Pres., Richard G. Taylor, of Buffalo—BULLETIN 76 (p. 56)
Vice-pres., George R. Blanchard, of New York—BULLETIN 76 (p. 56)
Sect., Wilson S. Bissell, of Buffalo—BULLETIN 76 (p. 56)
Treas., Bird W. Spencer, of Passaic, N. J.—BULLETIN 76 (p. 56)
Aud., John E. Ransom

The directors were the above (except Ransom) and

Charles L. Atterbury, of New York
Charles G. Barber, of New York
Elmer M. Bond, of Cuba
Edmund S. Bowen, of New York—BULLETIN 76 (p. 56)
John J. Carter, of Titusville, Pa.
Daniel O. Day, of Buffalo
Addison W. Smith, of Cuba
William P. Stevens, of Cuba
Royal C. Vilas, of New York

The superintendent of the Bradford, Eldred and Cuba was C. D. Williams of Wellsville; he was subsequently the superintendent of the Ketner, St. Marys and Shawmut, and a director of the Allegheny and Kinzua, and moved his residence to Ridgway, Pa.

The general office of the Bradford, Eldred and Cuba was Buffalo, N. Y.

Atterbury was a celebrated railroad and corporation counsel. He was first employed by the Erie in 1872.

Barber was the private secretary and assistant of H. J. Jewett, pres. of the NYLE&W. He was born in Chesterville in 1847, and educated in New York City but he refused to go to college. He entered government employ in Washington, and learned stenography, a rare accomplishment in those days; the senators took him around on their trips. In May, 1873, he became a private secretary to Pres. Watson of the NYLE&W, and his successor, Jewett, handling all the confidential matters. He was the treasurer of three coal companies and twelve collateral corporations controlled by the Erie. He resigned, with Jewett, in 1884. He was then appointed chairman of a committee to examine the Northern Pacific. In 1885 he started a coal business in partnership with his father, in New York City; this later became the Barber and Ziegler Coal Co. (wholesale only).

Bond was president of the First National Bank of Cuba from 1880-1886.

Col. John J. Carter of Titusville was a very successful oil operator. He was president of the Bradford, Richburg and Cuba, the Bradford, Bordell and Kinzua, the Bradford, Bordell and Smethport and the Rew City and Eldred.

Ransom was the secretary-treasurer of the Wellsville, Bolivar and Eldred, the Bradford, Richburg and Cuba, the BB&K and the BB&S.

Addison W. Smith was the son of Russell Smith, who was engaged in the mercantile and manufacturing business in Cuba.

William Philander Stevens, son of Henry Stevens, was born at Painted Post on Aug. 10, 1820. The family moved to Cuba when he was very small; he grew up and prospered in that community. It was said that he was one of Cuba's best businessmen, giving his time.

money, and activity to build up her industries and useful organizations. He entered the tanning business in 1844, and kept at it for 35 years. He was fire warden, chief of the fire department, a trustee of the cemetery, and a charter member of the local lodge of Odd Fellows. He was long a director of the Cuba National Bank, its vice-president for 6 years, and president for 7-½ years. He was a generous supporter of the Episcopal church.

Vilas was the general freight agent of the NYLE&W from 1873-1883, and a director of the BB&K.

The influence of the NYLE&W is seen in that five of the directors of the BE&C had responsible positions on that road.

During its first year, 1881, only 5.74 miles of rail were laid, but the road was completed between Cuba and Ceres in 1882. In reporting on their inspection trip, it was noted by the inspectors that cheapness and rapidity of construction were apparently the objective points. "The line is generally curved, ranging as high as 70°, and at times abruptly reversing, and frequently turning a full half circle. Strictly speaking, there is no ballast."

The equipment was well kept up; it consisted of 3 locomotives and 70 cars. The passenger cars were heated with coal, lighted with oil and had ventilators in the roof. The average running speed was 15 miles per hour, which was reduced to 12 miles per hour overall by including stops. In spite of being incomplete, at the end of the first year of operation, the Bradford, Eldred and Cuba, including the leased lines, showed net earnings of $2,377.18.

The next year, 1882, with the entire 53.69 miles in operation, and with 6 locomotives (3, 4-4-0, and 3, 4-6-0) and 132 cars, it had a surplus of $14,650,06. Unfortunately, hereafter only deficits were incurred. When the road defaulted on its bonds in January, 1885, a suit for foreclosure was begun by the Metropolitan Trust Co. of New York, and on February 4, 1885, the road was placed in the hands of a receiver. This position was held by Senator Thomas C. Platt—BULLETIN 76 (p. 59) of Owego. The official title of the road, Bradford, Eldred and Cuba Railroad Co., was changed in 1886 to The Bradford, Eldred and Cuba Railroad Co.

The line was allowed to deteriorate, as evidenced by the report in 1888 of an inspection committee for the Board of Railroad Commissioners of the State of New York. The report reads: "The main line of this road, from Cuba to Little Genesee Jct., a distance of about twenty miles, has not been operated for a considerable time, and appears to be practically abandoned. The inspection of the present year began at the Pennsylvania State line near Bullis' Mills station* and thence

*Bullis' Mills is a small community in Penna. near the state line, about midway between Eldred and Ceres, N. Y. It is very near the present State Line station of the PS & N; State Line was formerly only a signal tower at the junction of the PS & N and Penna. RR, while the former was operating over the BNY & P (later PRR) to Bishop's Summit, before they had finished their construction. The latter point was just below Clermont in McKean County. It will be recalled that this was the southern terminus of the second Lackawanna & Pittsburg (BULLETIN No. 64, p. 37). The PRR also has a station at Bullis' Mills.

easterly, about three and one-half miles, where the road again enters the State of Pennsylvania. At Ceres the Pennsylvania line is again crossed, and from this point to Wellsville, a distance of twenty-four and one-half miles, the road is in the State of New York.

"Between Bullis' Mills and Bolivar is by far the best part of the road. Each of the timber openings and trusses were examined and nearly all were found in every good condition. There is no masonry on the entire road. Bridge No. 30, a seventy-foot span through Howe truss, is in fair life of timber. The pile abutments are in poor condition and will be renewed this season. Bridge No. 32 is a wood through truss with arched upper chord; this structure is in very good order. Near Ceres is a double-span waterway of twenty-four feet each. The girders are trussed, but one of the rods was loose, which was afterwards remedied. The girders are two pieces of timber under each rail of six by sixteen inches section. Bridge No. 41, over Little Genesee Creek, has two thirty-six-foot spans of girder rod trusses. The girders are of pine, eight by sixteen inches section, with one truss rod one and one-half inches in diameter and about two feet depth of strut, all in good order. There are fourteen pile and trestle openings, aggregating sixty bays of fourteen and one-half feet each. These bridges are in fair condition. Between Bullis' Mills and Ceres the rails and ties are in very good order; but little attention is paid to track adjustment, and an uneven surface and irregular line is the result. Between Ceres and Bolivar the rail is at points badly worn and a renewal is necessary. The cross sleepers are in fair life, but the line and surface of track is rough and unworkmanlike. From Bolivar to Wellsville the superstructure is in exceedingly poor maintenance. Far too many ties are badly decayed, the rail much worn and bent and track too rough for the reasonable speed of trains. If this part of the road is to be operated longer, a thorough renovation of ties, rail and track adjustment is necessary. There are several minor openings for waterways, some of which require to be built at once. Near Wellsville are two spans of through Howe trusses of pile abutments and pier, and thirty-three bays of trestle bridge adjoining. The trestle has lately been rebuilt and the Howe trusses are yet in good life of material and show no signs of weakness. The way stations are little used and poorly maintained, except at Bolivar, where there is a fair depot. At Wellsville the Erie road furnishes terminal facilities."

After 1884, the line between Cuba and Little Genesee was closed during the winter, and was operated only in the summer. By a court order of Sept. 24, 1888, this last portion (19.40 miles) was abandoned and the rails taken up. The branch from Bolivar to Richburg was discontinued in 1885. The rolling stock still consisted of 6 locomotives, but the cars had decreased to 142; there were but two 4-6-0 locomotives left in 1891. The total deficit amounted to $208,988.56. Mr. Frank M. Baker of Owego was acting as agent for the receiver, and although President Taylor remained in Buffalo the railroad office had been removed to Wellsville. John E. Ransom of Buffalo had become secretary.

In 1891 Frank H. Platt, a brother of Senator Platt, became the president.

In 1890 the inspectors noted that the road had very little traffic, and in 1894 that "it is very difficult to see the reason for keeping the road open."

The deficit continued to pile up, reaching $271,240.54 in 1892, and on Jan. 14, 1893, the operation of the road was abandoned by court order. It was sold under foreclosure on Jan. 25, 1893 and the rails were removed the same year. This was probably the first large abandonment in U. S. railroad history.

Mr. Soranson writes: "Way back in my railroad career, we handled the direction of the Bradford, Eldred & Cuba and its accounting at the Addison, N. Y., office of the Addison & Northern Pennsylvania Railway. Hon. T. C. Platt was the receiver of the Bradford, Eldred & Cuba, and Frank M. Baker, General Superintendent of the Addison & Northern Pennsylvania Railway, was agent for the receiver and manager. W. W. Atwood of Wellsville was the local superintendent. This road, as then (1892) existent, ran from Wellsville, through Petrolia (nearby there was a large trestle, and much curvature in the track), Allentown, Bolivar (I think a branch originally ran to Richburg but it had been removed at that time, although when Mr. Baker and I went there by team from Bolivar, there was no evidence of any track), thence to Ceres and Eldred, the terminal, where connection was made with the Bradford, Bordell & Kinzua. The purpose of Mr. Baker's trip was based on the future of the Bradford, Eldred & Cuba; he interviewed all the principal oil producers, businessmen and people generally. For the past few years, prior to this trip, there was a great decline in oil activity, and, if I remember rightly, crude oil was bringing only seventy-five cents per barrel at the wells. One of the largest producers in the Bolivar and Richburg field was very gloomy about the outlook, and no new ventures were entertained. This practically decided for the future the fate of the railroad, and although it was operated for several months thereafter, during the succeeding winter Mr. Platt decided that the road must be closed. It was decided to scrap the road, and much of the equipment was shipped away to purchasers; I believe one engine, later scrapped, was sent to the Addison & Northern Pennsylvania. Most of the road was torn up, and if memory can be trusted, this was applicable to the road from Wellsville to Bolivar in its entirety. The balance from Bolivar to Eldred undoubtedly passed to other hands and may have been incorporated into the Pittsburg, Shawmut and Northern, although I am not in a position to state."

An inquiry on this point from Mr. J. N. Thompson, Chief Engineer Maintenance of Way of the Pittsburg, Shawmut and Northern in 1943, received the following reply: "The modern Pittsburg, Shawmut and Northern roadbed coincides with the old Bradford, Eldred and Cuba road bed for a distance of about 2.6 miles between Bolivar, N. Y., and near Bullis' Mills, Pa., mostly in the vicinity of the New York-Pennsylvania state line. The balance of the distance the old road is parallel

but isolated. From State Line to West Eldred the old line is entirely separated from the Pittsburg, Shawmut and Northern."

Records of any locomotives on the BE&C are impossible to locate. Mr. Frederick Westing of the Baldwin Locomotive Works reports that a No. 18, named W. Bradley, was built in 1873, (construction number 3193), with 36" diameter drivers and cylinders 12 x 16"; it had a diamond stack and burned soft coal. It originally went to the Cairo and St. Louis RR. (This 3-ft. road was opened in 1875, reorganized in 1881 to the St. Louis and Cairo, and leased to the Mobile and Ohio in 1886. The latter widened the road, and presumably it was after that that the engine was sold to the BE&C.)

WELLSVILLE, BOLIVAR AND ELDRED

The Wellsville, Bolivar and Eldred RR Co. was chartered in the state of New York on April 29, 1881, to construct a line between Wellsville and Hamlet, a distance of 21 miles, and (at once?) leased to the Bradford, Eldred and Cuba. The directors, all of Wellsville, were L. S. Anderson, William C. Baldwin, William Beever, J. H. Clark, Isaac W. Fassett, Aaron R. Hill, and William F. Jones. As finally built, the line extended from Wellsville to Little Genesee (19.07 miles) with a 1.95-mile branch from Bolivar to Richburg. The capital stock authorized was $200,000, but only $6,990 was paid in. The cost of building the road was $412,400. As of 1885, the officers were: Pres., R. G. Taylor; Sect., W. S. Bissell; Treas., B. W. Spencer; and Aud., J. E. Ransom. The official address was Bradford, Penna.

BRADFORD, RICHBURG AND CUBA

The Bradford, Richburg and Cuba Railroad Co. was chartered in March, 1881, and opened in July of the same year. It was at once leased to the Bradford, Eldred and Cuba. Its purpose was to fill the gap between Eldred, Pa., and Ceres, N. Y., a distance of 9.36 miles. The capital stock authorized was $100,000, but only $3,100 was paid in; the cost of the road was $187,200. The officers were: Pres., John J. Carter (p. 67); Sect., John A. Read; and Treas., W. C. Warner, in 1882; whereas in 1890, John E. Ransom was Sect., and George A. Eckbert was the treasurer. The official address was Bradford, Pa.

Eckbert was the treasurer of the BB&K, BB&S and RS&E.

Wm. W. Brown (p. 72) was president at one time.

THE BRADFORD, BORDELL AND KINZUA GROUP

The Bradford, Bordell and Kinzua and Bradford, Bordell and Smethport Railroads were built in the interests of The New York, Lake Erie and Western RR. (now the Erie), to enable it to reach the oil fields of northern Penna., then in a process of development. The Rew City and Eldred was built to make the connection between the Bradford, Bordell and Kinzua and the Bradford, Eldred and Cuba. These

narrow gauge roads, with their leased lines, gave the NYLE&W a direct entry into this locality.

The Big Level and Kinzua was built at a later date, to give these roads access to the Pittsburgh district, by way of the Pittsburgh and Western RR.

Bradford and Smethport are still thriving towns in this region; Bordell was a small settlement at the end of a 2.81-mi. branch. Rew (City) is a crossroads near the crest of the Allegheny Mountains. Kinzua is a local name that appears in the name of many railroads in the area; there is also a creek, the famous Kinzua Bridge of the Erie, BULLETIN 76 (p. 50) and a village in Warren Cty. 50 miles to the west.

BRADFORD, BORDELL AND KINZUA RAILROAD CO.

The Bradford, Bordell and Kinzua Railroad Co. was organized in Pennsylvania on Mar. 3, 1880, with a capital stock of $250,000, to build a 3-ft. gauge line from Bradford, down the valley of Kendall Creek to Simpson, a distance of 18 miles, with a 2.81-mi. branch to Bordell from Kinzua Jct. The stated object was to develop a new oil district. The contract for the construction was awarded to Craigie, Lafferty and Youmans on Mar. 16th, with the condition that cars must be running to Bradford by June 15th. The first locomotive, used for construction purposes, was placed on the track on April 17th, and the road was opened for traffic as far as Kinzua Jct. on June 7, 1880. The extension from Simpson to Smethport was accomplished by a lease of the Bradford, Bordell and Smethport (11.45 miles) (p. 00). This extension had one wooden bridge and 11 trestles; there were none on the BB&K itself. The contract for this extension was let in Sept., 1880 and the first train arrived in Smethport on Dec. 16th. The total mileage, all in operation by Dec. 31st, was 29.26. The cost of the road was $198,827.63, and of the equipment, $76,136.99. The road boasted 5 locomotives and 77 cars.

The officers and directors were as follows:

Pres., Col. John J. Carter, of Titusville, Pa. (p. 67)
Vice-pres. and Genl. Mgr., R. G. Taylor, of Buffalo—BULLETIN 76 (p. 56)
Sect.-treas. and Genl. Supt., B. C. Williams, of Buffalo
Genl. Solicitor, W. W. Brown, of Bradford
W. S. Bissell—BULLETIN 76 (p. 56)
B. N. Hurd
R. G. Person, of E. Aurora, N. Y.
John A. Read (p. 70)
H. F. Sweetser
R. C. Vilas (p. 68)
A. I. Wilcox

Several of these directors have been met before, on account of their interests in the other three-footers, and their connection with the NYLE&W.

Brown was president of the Bradford, Bordell and Smethport, and a director of the Kinzua Creek and Kane.

Williams was general manager of the TV&C in 1884, and sect.-treas. of the BB&S, and of the Rew City and Eldred.

An account of the (second) complete year of operations shows that the total mileage that trains ran was 111,291; of this, 68,478 were passenger, 25,666 were freight, and 17,147 were mixed. The passengers carried totaled 190,324, and the freight moved was 38,005 tons; it appears that the road began as a carrier of human freight! One might hazard the guess that the seekers after oil were a roving population. The government paid $42.75 per mile, daily except Sunday, for transportation of the mails. The earnings from passenger operations were $92,172.81 and from freight, $61,457.45; with some other income the total earnings were $160,773.53. As the operating expenses were $87,-149.33, the net was $73,624.20. Dividends were $60,000 (24%), dividends the year before had been $19,900 (8%). The first one was paid Sept. 1, 1880, and the last, June 1, 1882; the total paid during the life of the road was $97,500 (39%). In McLauren's "Sketches in Crude Oil" (privately published) it stated that Col. J. J. Carter, as president of the BB&K, completed the road in 90 days, and that in 18 mos. it had returned the stockholders 80% in dividends. There is no indication of how this figure was arrived at.

During 1882 the Rew City and Eldred was completed and leased to the BB&K, thus providing the connection with the Bradford, Eldred and Cuba. In Poor's Manual for 1888, p. 113, it states that to provide the means for this work the capital stock of the BB&K was increased from $250,000 to $500,000, and $500,000 of bonds issued, the proceeds of the latter furnishing sufficient means to complete the RC&E. Having completed the building of the roads and leased others to complete NYLE&W, by which the latter agreed to guarantee the interest on the $500,000 bonds. In return, the NYLE&W secured complete control of the entire system of roads owned or leased by the BB&K, and at once assumed the management of the latter's affairs. It is claimed that at the time of the transfer there was in the BB&K treasury more than $61,000, with no indebtedness, sufficient to pay all the interest for 2 years. Nevertheless, on Dec. 1, 1884, the NYLE&W defaulted, so on Jan. 1, 1885, the BB&K resumed the control of its own affairs. During 1883 D. W. Spencer BULLETIN 76 (p. 56) was added to the board of directors; possibly this was to represent the NYLE&W interests more actively.

Mr. George C. Frank writes: "The Bradford, Bordell and Kinzua Railroad Co. was not an Erie Company, although it was said to have been built in the interests of The New York, Lake Erie, and Western Railroad Co. to enable it to reach the northern Pennsylvania oil fields, by parties friendly to the Erie. Under date of March 12, 1883, the Bradford, Bordell and Kinzua Railroad Co. made a contract with The New York, Lake Erie, and Western Railroad Co., which recited that the road had been constructed by parties in sympathy with the Erie company, with a view of contributing to its business, and protecting it against hostile lines then in process of construction, and by that agreement the Bradford company agreed to turn over all the freight under

its control to the Erie company, and to deposit a majority of its capital stock with the Erie company, retaining the right to vote thereon, etc.

"The Erie Co. on its part agreed to make certain advances to the Bradford company in return therefore was given a second lien upon the earnings of the Bradford company.

"In 1885, default was made in the payment of its interests by the Bradford company, and the Erie company refused to advance the money for that purpose, in which position, we understand, it was sustained by the Court.

"Under date of March 12, 1883, similar contracts were made by the Bradford, Eldred and Cuba Railroad Co., and the Tonawanda Valley and Cuba Railroad Co. with The New York, Lake Erie, and Western Railroad Co."

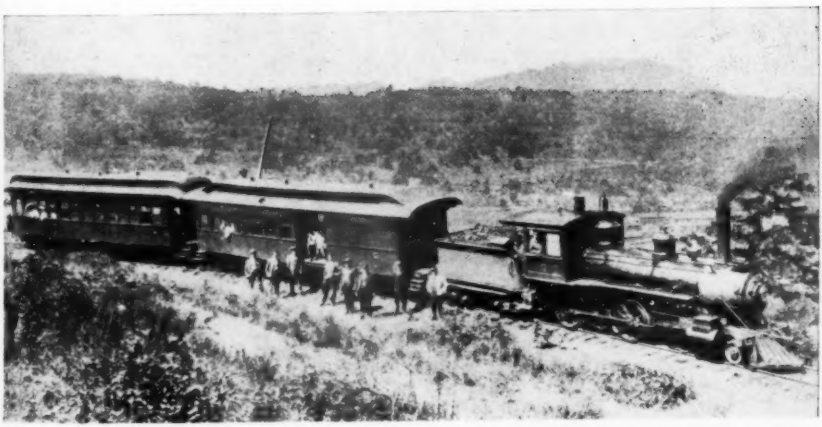
With the lease of the RC&E, the mileage operated totaled 40.54 miles. J. E. Ransom now (1884) became secretary of the three roads, BB&K, BPB&S, and RC&E, and Geo. A. Eckert, the treas. (p. 70). In 1885, T. Loomis became vice-pres., and W. R. Dieffenback, auditor. In 1888 we find that C. T. Griggs had become the treasurer.

An interesting but disastrous incident that occurred on BB&K on Jan. 15, 1884, was the running of a 2-car passenger train through flaming oil; it is well described by a passenger, Charles W. Logan, in "Railroad Stories" for Sept., 1934, and in the "Warren Mail" of Jan. 22, 1884. Briefly summarized, a pool of crude oil from a leaky tank of the Anchor Oil Co. near the right of way on the hill descending into Bradford accumulated in a low spot and covered the rails for about a hundred yards to a depth of several inches. At the particular point the vision of the engineer was obscured by a hill and curve, and the track was further walled in by a cut through deep snow. The oil was set afire by hot coals from the ashpan of the engine of the onrushing train; application of brakes failed because of the down grade and the oil, so the engineer allowed the train to coast through the fire. The train was eventually derailed when the engine struck a sharp curve and turned over. There were many casualties in the rear coach where 20-25 passengers were trapped; some were saved by being thrown from the windows, or jumping. The deep snow prevented the oil men from reaching the track in time to flag the train, after they heard it coming. The locomotive was No. 5, a Brooks mogul.

On Dec. 1, 1886, the Big Level and Kinzua Railroad was opened and leased by the BB&K, and a joint traffic agreement made between this road, the Bradford, Bordell and Kinzua, and the Pittsburgh and Western. According to the terms of the agreement, the BL&K was to maintain its road, the BB&K were to operate it without charge and pay over the gross earnings, and the P&W was to forward all traffic controlled by it and to pro rate fares and freight. Thus the BB&K secured entry into the Pittsburgh area. Including trackage rights over the P&W between Mt. Jewett and Kane, the BB&K now operated 62.32 miles.

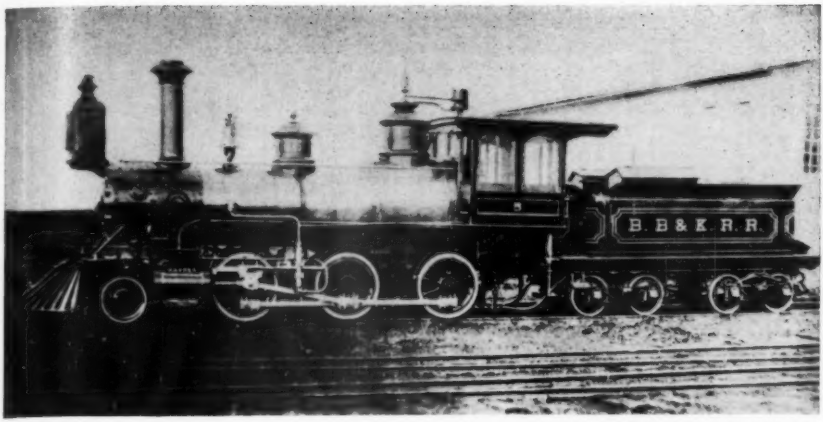
Unfortunately the deficits continued to pile up, even with changes in the vice-presidents; W. I. Wilcox held that position in 1889, and W. W.

Last Train on the Big Level & Kinzua R. R.



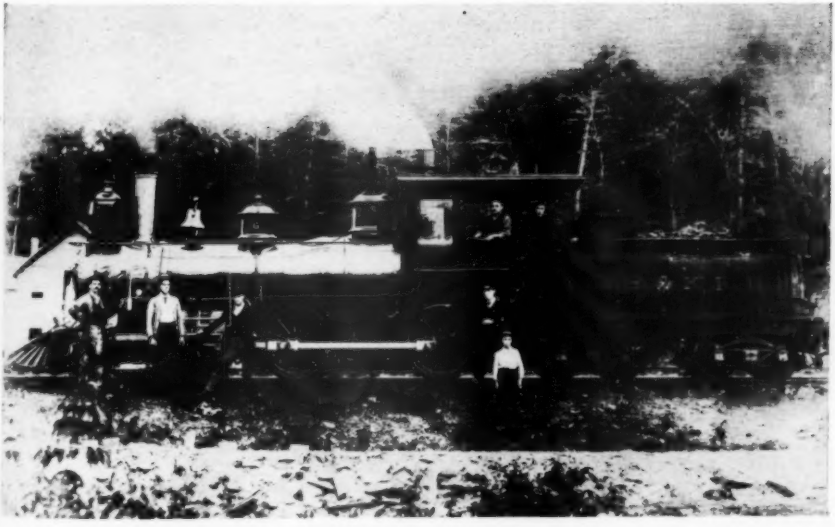
Courtesy Granville Thomas

Last train on the Bradford, Bordell & Kinzua or Buffalo, Bradford & Kane



Courtesy of D. H. Kirkwood

B B & K #5, Brooks, 1880.



A Brooks 4-4-0 on the B B & K; #6.

BRADFORD, BORDELL & KINZUA RAILWAY.

GEO. L. ROBERTS, President, Carnegie Bldg, Pittsburgh, Pa.
H. K. POMROY, V.-Prest., 39 Broad St., N.Y.
J. B. MCGEORGE, Sec'y, "

JNO. C. MCKENNA, Gen. Mgr. and G. F. & P. A., Bradford, Pa.
A. B. CAMPBELL, Treas. & Aud., Bradford, Pa.

9	7	5	3	1	Ms	*June* 1, 1902.	2	4	6	8	10
P M	P M	P M	A M	A M	...	(*Eastern time.*)	A M	Noon	P M	P M	P M
‖6 15	†4 10	†1 20	*10 15	†7 30	0	lve. **Bradford**[1] arr.	9 35	12 20	3 25	6 10	5 00
6 31	4 26	1 36	10 31	7 48	3	.....Tarport	9 20	12 06	3 11	5 57	4 48
6 39	4 34	1 44	10 39	7 56	5	.....Hazlewood	9 14	12 00	3 05	5 51	4 40
6 53	4 48	1 58	10 53	8 10	9	. Kinzua Junction .	9 00	11 48	2 53	5 40	4 28
6 57	4 52	2 02	10 57	8 14	11	..... Aiken	8 55	11 42	2 47	5 35	4 22
7 02	4 57	2 07	11 02	8 19	13	.....Davis	8 50	11 37	2 42	5 30	4 17
7 09	5 04	2 14	11 09	8 25	15	..... Simpson	8 44	11 30	2 36	5 24	4 10
7 11	5 06	2 16	11 11	8 27	16	..... Cyclone	8 42	11 27	2 32	5 22	4 07
7 15	5 10	2 20	11 15	8 31	17	..... McKeans.....	8 38	11 23	2 28	5 18	4 03
7 20	5 15	2 25	11 20	8 35	...	arr....Ormsby..lve.	8 35	11 20	2 26	5 15	4 00
7 45	5 40	2 50	†11 50	9 00	25	arr.(**Smeth-**)lve.	8 00	10 45	1 50	4 40	....
6 50	4 40	1 50	†10 45	8 30	25	lve.) **port**[2])arr.	9 00	11 50	2 50	5 40	....
7 21	5 16	2 26	*11 21	8 36	18	lve...Ormsby Jn..arr.	8 34	11 19	2 24	5 12	3 59
7 39	5 34	2 44	11 37	8 52	24	.. Kinzua Bridge ..	8 20	11 05	2 10	4 57	3 45
7 42	5 37	2 47	11 40	8 55	25	.... McAmbleys	8 15	11 00	2 05	4 54	3 40
7 52	5 47	2 57	11 50	9 05	28	... **Mt. Jewett**[3] ..	8 04	10 49	1 54	4 43	3 29
8 02	5 57	3 07	11 59	9 14	31	.....Lafayette.....	7 54	10 39	1 44	4 33	3 19
8 08	6 03	3 13	12 04	9 19	33	..... Griffiths	7 48	10 33	1 38	4 28	3 13
8 14	6 09	3 19	12 09	9 24	35	..... Kaneshohn.....	7 43	10 28	1 33	4 23	3 08
8 19	6 14	3 24	12 14	9 29	38	..... Greendale	7 38	10 23	1 28	4 18	3 03
8 25	6 20	3 30	12 20	9 35	40	.. Kane Junction ..	7 31	10 16	1 21	4 12	2 56
8 30	6 25	3 35	12 25	9 40	41	arr.... **Kane**[4] ..lve.	*7 25	†10 10	†1 15	†4 05	‖2 50
P M	P M	P M	Noon	A M	...	(*P. R. R. Depot.*)	A M	A M	P M	P M	P M
.....	.....	.....	.....	A M	...	(*Penna. R.R.*)	A M	.....	.....	.....	.....
9 01	P M	.....	.....	11 33	.....	**Wilcox**	6 35	.....	11 59	A M	.....
9 13	P M	.....	.....	11 48	.....	**Johnsonburg**..	6 25	.....	11 52	A M	.....
9 28	P M	.....	.....	12 05	.....	**Ridgeway**....	6 10	.....	11 34	A M	.....
9 45	P M	.....	.....	2 41	.....	**St. Mary's**	5 53	.....	11 13	A M	.....
10 25	P M	.....	.....	3 20	.....	**Emporium** ...	– –	.....	10 30	A M	.....
1 20	A M	.....	.....	6 45	.....	**Williamsport**..	2 35	.....	7 12	A M	.....
4 15	A M	.....	.....	10 10	.....	**Harrisburg** ...	12 06	.....	3 35	A M	.....
7 20	A M	.....	.....	2 30	.....	**Baltimore** ...	9 00	.....	11 56	P M	.....
8 30	A M	.....	.....	4 05	.....	**Washington** ..	7 45	.....	10 40	P M	.....
7 22	A M	.....	.....	4 25	...	arr. **Philadelphia** lve.	8 50	.....	11 28	P M	.....

FOXBURG DIVISION.

.....	No. 5		No. 1		Mls.	*June* 1. 1902.	No. 8		No. 4	
.....	†4 30	P M	†9 50	A M	0	lve.. **Kane**[4] & arr.	3 57	P M	10 00	A M
.....	– –		– –		1.0	...Kane Junction...	– –		– –	
.....	4 47	"	10 04	"	4.5	.....Lamont.....	3 42	"	9 45	"
.....	4 59	"	10 15	"	8.5	.....Carlsons.....	3 30	"	9 33	"
.....	5 14	"	10 26	"	13.0	....Russell City....	3 15	"	9 18	"
.....	5 30	"	10 41	"	18.0	**Sheffield Junc**[5] &	3 00	"	9 03	"
.....	5 52	"	10 58	"	24.3	.....Frosts.....	2 40	"	8 43	"
.....	5 59	"	11 04	"	26.5	.....Byromtown.....	2 33	"	8 35	"
.....	6 11	"	11 14	"	30.1	.....McCray's... &	2 21	"	8 21	"
.....	6 17	P M	11 20	"	32.1	.....Marienville... &	2 15	"	†8 15	A M
.....	.....		11 43	"	40.2	.....Vowinckle... &	1 50	"	.....	
.....	.....		11 50	A M	42.4	.....Crown	1 43	"	.....	
.....	.....		12 00	Noon	45.8	....Tylersburg... &	1 34	"	.....	
.....	.....		12 10	"	49.9	....Snydersburg ...	1 20	"	.....	
.....	.....		12 15	"	51.7	.....Lucinda.... &	1 15	"	.....	
.....	.....		12 25	"	54.9	.....Arthurs.....	1 04	P M	.....	
.....	No. 25		12 36	Noon	58.3	ar. **Clarion Jn.** & lv.	12 53	Noon	No. 28	
.....	†6 00	A M	†12 40	Noon	58.6	lv. **West Clarion** & lv.	†12 49	Noon	8 33	P M
.....	6 04	A M	12 45	Noon	58.3	lv... **Clarion Jn.**..ar.	12 45	Noon	8 30	P M
.....	6 19	"	1 00	P M	61.9	....Shippenville... &	12 32	"	8 16	"
.....	6 33	"	1 16	"	66.5	.....Knox..... &	12 15	"	8 00	"
.....	6 44	"	1 27	"	69.5	.....Jefferson.....	12 03	Noon	7 48	"
.....	7 02	"	1 43	"	74.4	.....Turkey.....	11 45	A M	7 30	"
.....	7 16	"	1 57	"	78.5	....St. Petersburg. &	11 30	"	7 15	"
.....	7 30	A M	2 13	P M	82.5	arr. **Foxburg**[6] & lv.	†11 15	A M	†7 00	P M
.....	.....		4 00	P M	113.5	.....**Butler**.....	9 30	A M	5 15	P M
.....	.....		5 25	P M	153.0	arr. **Alleghony** lv.	†7 30	A M	†3 20	P M

* Daily; † daily, except Sunday; ‖ Sunday only.
□ Pennsylvania R.R. station. & Telegraph stations.

Connections.—[1] With Erie R.R.; Buffalo, Rochester & Pittsburgh Ry. and Pennsylvania R.R. [2] With Pennsylvania R.R. [3] With Erie R.R.; Buffalo, Rochester & Pittsburgh Rv.; Pittsburg, Shawmut & Northern R.R. [4] With Pennsylvania R.R. (P. & E. Div.) [5] With Tionesta Valley R.R. [6] With Pennsylvania R.R.

Time table of the B. B. & K. R. R., June 1, 1902.

Brown in 1890. With a deficit of $198,294.98 in 1891, a receiver was appointed on Dec. 12th of that year. This position was held by George L. Roberts of Bradford, while W. R. Dieffenbach became treasurer and auditor. The road was sold at foreclosure for $62,833.85 on Jan. 18, 1892, to a committee of bondholders. It was reorganized on Mar. 8th, and incorporated on the 26th as the Bradford, Bordell and Kinzua Railway Co. At this date the BB&K owned approximately 18 miles between Bradford and Simpson, which it had acquired by construction in 1880-1.

BRADFORD, BORDELL AND SMETHPORT

After the reorganization, the trackage rights from the P&W, and lease of the BL&K were discontinued; the Rew City and Eldred was abandoned in 1893. It will be recalled that the RC&E was built to provide a connection with the Bradford, Eldred and Cuba, and with the abandonment of that road in 1893 there was no longer any reason for the continuance of the RS&E. The mileage of the reorganized BB&K Ry. was 29.50, which included 1.5 miles of both narrow and standard gauge road extending from Smethport to E. Smethport, and the formerly leased BB&S. The latter had been sold under foreclosure on Mar. 3, 1892, and transferred to the BB&K by its purchasers.

Roberts and Dieffenbach held over the same offices, and H. K. Pomroy of New York became vice-pres. August Stein BULLETIN 76 (p. 59) was a director.

It had 6 locomotives and 150 cars. For the next few years it was operated by the committee of bondholders, and for a few years showed small surpluses; the first year the surplus was $2,220.76. In 1901 there was a deficit of $45!

The oil rush was over, and the bulk of the drillers and speculators had moved elsewhere; by the standards of the gusher wells, the area was considered no longer of interest. This accounted for the hard times experienced by the BB&K. With the application of modern methods of pumping, and operation only a few hours per day, these oil fields are still yielding considerable quantities of oil.

With the exhaustion of lumber farther east, attention was next turned to the virgin forests, and for the next 15 years lumber and forest products provided the great bulk of traffic that kept this and other railroads in the area in existence. The Goodyears, who built up the Buffalo & Susquehanna (BULLETIN No. 49, p. 33) and who specialized in lumber operations, and the Bullis family soon appeared in the list of officials, as the Erie group withdrew.

In 1896 a short branch of 6.87 miles, from Kinzua Jct. to Rixford, was added, and the total miles operated became 32.1. On June 30, 1896, the Big Level and Kinzua (10.50 mi.) was again leased and trackage rights (12.50 mi.) over the Pittsburg and Western between Mt. Jewett and Kane were obtained, so that the BB&K now operated a total of 50.16 miles; one locomotive and half a dozen cars had been added.

The officers and directors were as follows:

Pres., George L. Roberts, of Bradford
Vice-pres., H. K. Pomroy, of New York
Sect., J. B. McGeorge, of New York
Treas. and Aud., A. B. Campbell, of Bradford

Directors, all the above except the last, and

J. J. Carter (p. 67)
J. R. Cowing, of New York
Charles Dana, of New York
D. H. Jack—BULLETIN 76 (p. 62)

In 1890 President Roberts was also a director of the newly-organized standard gauge 32-mile Allegheny and Kinzua Railroad Co. (p. 83), which ran between Bradford and Coffey Run, and from Gilbert to Red House in New York.

On Nov. 11, 1901, the BB&K leased for one year the narrow gauge division of the Pittsburgh and Western, at a rental of 48.5% of its gross earnings. The Pittsburg and Western accounted for the short term of the lease by regarding it as temporary. They intended to make the line standard gauge and did not wish to re-equip it. This division extended 92.99 miles from Mt. Jewett to Foxburg. The BB&K now operated a grand total of 130.58 miles. The accompanying timetable lists the trains and stations. Unfortunately, a deficit of $38,077 was incurred; this was too much for the small road, so at the end of the year this division of the P&W, except for the segment between Kane and Mt. Jewett, was returned to its owners. A. B. Campbell was appointed as the general manager in 1903. The Bradford, Bordell and Kinzua Railway Co. was sold at a judicial sale on Dec. 4, 1903 to Buffalo & Susquehanna interests, and reorganized on Jan. 6, 1904, as the

Buffalo, Bradford and Kane Railroad Co.

At its organization the new company acquired the property, rights, and franchises of the BB&KRyCo., issuing $300,000 in capital stock to pay for this. The new company operated a total of 48.08 miles, made up of its own line between Bradford and Smethport, the leased Big Level and Kinzua, and trackage from the B&O (now owners of the P&W) between Mt. Jewett and Kane. The line from McKeans to Smethport paralleled that of the Mt. Jewett, Kinzua and Riterville (see under the Smethport RR.).

The new officers were as follows:

Pres., Marlin E. Olmstead, a lawyer, of Harrisburg
Vice-pres., C. W. Goodyear, of Buffalo
Sect.-treas., Fred A. Lehr, of Buffalo
Aud., William H. Baumes, of Buffalo
F. H. Goodyear, of Buffalo
S. F. Channell, of Buffalo
H. D. Shove, of Buffalo
F. E. Watrous, of Buffalo

The Buffalo and Susquehanna influence is obvious. The activities of the Goodyears are summarized in BULLETIN No. 49, p. 33; they were the

moving power behind the B&S, the Buffalo, Arcade and Attica, and the New Orleans Great Northern. Olmstead was a director of the B&S and treasurer of the NOGN. Lehr and Baumes held the same positions on the BB&K, BA&A, and B&S, while Shove was a director of the BA&A. The office was at Bradford. The road had 7 locomotives and 78 cars.

A report of the operations for six months ending June 30, 1904, reveals that 26,311 passengers were carried, with earnings of $13,514; and 13,269 tons of freight were moved, from which operations $11,261 was realized. With other small receipts, and expenses, the result was a small deficit of $4,420.

Control of the Buffalo, Bradford and Kane changed hands with the election of a new group of officers and directors on Jan. 10, 1905.

Pres., W. W. Bell, of Bradford—BULLETIN 76 (p. 62)
1st Vice-pres., S. S. Bullis, of Olean—BULLETIN 76 (p. 62)
2nd Vice-pres., G. P. Bullis, of Beaumont, Tex.
Sect.-treas., R. S. Bullis. of Bradford
A. B. Campbell—BULLETIN 76 (p. 62)
D. H. Jack—BULLETIN 76 (p. 62)
C. V. Merrick—BULLETIN 76 (p. 62)

G. P. Bullis gave Natchez, Miss. as his address before going to Texas.

R. S. Bullis was sect.-treas. of the Big Level and Kinzua in 1906.

Mr. Sorenson states that the Goodyears and the Bullises were closely associated in the lumber business, which, doubtless, accounts for the coincidences in the change of control of this road and the Buffalo, Attica and Arcade (p. 60—BULLETIN 76). "Frank H. Goodyear, who originally equipped and established a sawmill near Gardeau, and later organized and managed the Sinnemehoning Valley Railroad, and eventually the Buffalo & Susquehanna Railroad system, as well as the Goodyear interests, with their mammoth sawmills at Austin and Galeton in Potter County appears to have been the first farseeing person in that section of the state to grasp the monetary possibility of lumbering on an extensive scale.

"Grants were usually made by individual counties on unseated forested lands during the early 1870's but such grants were generally issued for only a certain portion or section. The first Goodyear transaction covered only the small northern section of Cameron county. It did not include a well-forested plot, styled the Potato Creek section, lying immediately north in McKean Cty.; hence, the enterprise took an eastern turn toward Potter Cty., where such grants were easily secured and his lumbering business flourished for many years. To the west of Cameron Cty. which land comprised a portion of Elk Cty., other parties had secured grants, and soon the Hall & Kaul Lumber Co., of St. Marys, were building tram roads in every direction throughout what is known as the Glen Hazel section, for the purpose of taking bark and logs to St. Marys; at this point their mills were established, besides other remunerative ventures, such as a chair factory, tannery, large sawmill, kindling wood factory, and cooperage plants. Mr. James Hall, heading this firm, was a state senator at Harrisburg; evidently this contributed

largely to his prowess in securing grants and scooping up these timber tracts in that section. Soon a branch of the Pennylvania railroad, from Larabee, entered this forested basin to grasp a share of the rich traffic of lumber manufactured as well as products of the various chemical companies engaged in producing acid and other salable products. A little later the Shawmut interests also entered this territory from the south by procuring sections of the tram roads right of way and other concessions.

"Mr. Goodyear, however, working eastward and southerly always kept in mind the tract from near Gardeau reaching northerly to the vicinity of Smethport and Port Allegheny. Being a resident of Buffalo, he could not, under Pennsylvania laws, become president of the concern; he saw early in his career that this position must be held by a competent legal man to administer the duties of president and follow his wishes. An eminent jurist, Marlin E. Olmstead, of Potter Cty., was selected to fill this office; as he was at that time a representative at Harrisburg, he could keep in close touch with grant and other legal activities necessitated by the laws of Pennsylvania.

"The gladiators in contest for this activity were Col. James Hall for the Hall & Kaul activities, and Hon. Marlin E. Olmstead for the Goodyear interests. The contest existed for many years; during the closing years of the last century, the decision was made that the Goodyear interests were entitled to this tract (Potato Creek). This break came at a time when this valuable lumber was necessary for continuation of the B&SRR and operation of the mills at Austin, as the forests in that vicinity were being rapidly depleted. Looking further into McKean Cty, the Goodyear interests noted that the railroads on the plateau (BB&K and related lines) were in a precarious position, and decided that a union of these activities would aid each other, and also make available the remaining timber on the oil plateau. Therefore, these interests took over both the lumbering and railroad activities. Mr. Olmstead was in Austin many times during this period, and, as a stenographer, I came to know him quite intimately. Later, while in the employ of the Shawmut interests, and working at St. Marys as a stenographer in the traffic, management, and accounting departments, I learned quite vividly both sides of the story.

"The merger of the many different railroad companies after these interests combined, was really an idea to satisfy a trend to work together, and not for the purpose of diverting this lumber business in other directions. It was destined to aid the Buffalo & Susquehanna Railroad and its extensions which extended southward to mining interests in the DuBois district, such as cross ties, mining timber, etc. This action satisfied the oil interests by securing needed utensils and supplies needed from the Pittsburgh district.

"The Bullis' interests in these oil roads, and projects of the Goodyears in lumbering in the south and also construction of a railroad through the lumber belt of Mississippi, known as the New Orleans Great Northern, resulted in their harmoniously working together in the foregoing as well as later developments."

In the Railroad Gazette for Sept. 14, 1906 it was noted that the Buffalo, Bradford and Kane will be abandoned and the tracks taken up, and it was reported as having been abandoned in the 1906 Poor's. The last train to Kane was run on Sept. 2, 1905. On Jan. 11, 1905, the Keating and Smethport leased 0.9 mi. of the BB&K in Smethport. The K&S, in turn, was leased to the Mt. Jewett, Kinzua, and Riterville, resulting in a sublease of the BB&K to that road. Hence, on Oct. 3, 1931, when the Interstate Commerce Commission authorized the Baltimore and Ohio to acquire control of the MtJK&R, at the same time it authorized them (the B&O) to abandon the "BB&K of its line in Smethport (0.6 mi.)." Mr. R. Davis states that the Buffalo, Rochester & Pittsburg bought the residue of the BB&K in 1906, in order to eliminate two grade crossings, one each in Bradford and Mt. Jewett, where they had to maintain watchmen. The Mt. Jewett crossing was on the leased BL&K (p. 81).

Information on the BB&K locomotives is scanty. Mr. Kirkwood reports that there were ten in all, numbered 1-10. No. 5 was obtained new, from Brooks. Nos. 8 and 9 were formerly Tonawanda Valley and Cuba Nos. 4 and 5, built by the Pittsburgh Locomotive Works in 1882. No. 10 was built by Baldwin in 1881 (with 14 x 20" cylinders, 45" drivers, and 130 lb. steam pressure), for the Denver and Rio Grande; it was named Silverton and numbered 150. In 1892 it was sold to the BB&K. No. 7 (origin unknown) and No. 10 were sold to the Big Level and Kinzua, retaining their numbers on that road. No. 10 was acquired by the Baltimore and Ohio when it bought the BL&K, and sold by them to the West Virginia Midland.

BRADFORD, BORDELL AND SMETHPORT

When the fever of narrow gauge railroad construction was at its height, there was considerable clamor for a road between Bradford and Smethport. The Bradford, Bordell and Kinzua had the edge, having a line as far as Simpson, so they organized the Bradford, Bordell and Smethport RR. Co. on Apr. 21, 1880, with a capital stock of $100,000. Their rival was the Bradford, DeGolia and Smethport.*

* The "Warren Mail" for Mar. 23, 1880 notes that the Bradford, DeGolia and Smethport was organized to build a 15-mi. road between Bradford and Smethport, and in the May 11th issue "the rival roads at Bradford have done the sensible thing and combined their interests, thereby making sure that one of them will get to Smethport soon. The BDeG & S is no more." The latter was consolidated with the BB & K, surrendering its charter and agreeing to subscribe $30,000 for stock in the BB & K. The officers and directors of the BDeG & S were as follows:

Pres., L. Emory, Jr.
Sect., Eben Brown
Treas., Robert H. Rose, of Smethport
George A. Berry, of Bradford
W. C. Kennedy
C. S. King
M. A. Sprague
R. B. Stone
P. H. Towell (contractor who built part of the OB & W)

The road (11.45 mi.) was finished on Dec. 1, 1880, and leased to the BB&K on the 15th; the annual rental was set at $12,000 for the first two years, and at two-sevenths of the net earnings of the BB&K and its leased lines thereafter. In the financial report of the BB&K, an expenditure of $9,000 per year is set down as the amount paid for rental of the BB&S; whether the rental was reduced by negotiation, or what the true explanation is, is uncertain.

The road, which owned one locomotive and two passenger cars, was formally opened on Jan. 10, 1881, with an excursion train. The first year the dividends paid were 9% ($9,000); in 1883 they were $12,050.

W. W. Brown (p. 72) was the first president, and B. C. Williams (p. 72) the sect.-treasurer. In 1884, J. J. Carter (p. 66) was president, and G. A. Eckert (p. 71) was secretary, while in 1892 W. R. Dieffenbach (p. 75) was treasurer.

Along with the BB&K and RC&E, this road was under the control of the NYLE&W from 1883-1885.

It was sold under foreclosure on Mar. 9, 1892, and on Apr. 1st consolidated by its purchasers into the Bradford, Bordell and Kinzua Railway Co. At this time it owned approximately 11.50 miles, ten miles being narrow gauge between Simpson and Smethport, and about 1.5 mi. between Smethport and East Smethport being both narrow and standard gauge. All this property had been acquired by construction in 1880-1881.

REW CITY AND ELDRED

The Rew City and Eldred Railroad Co. was chartered in Pennsylvania in March, 1882, with a capital stock of $111,000, for the purpose of serving as a connecting link between the Bradford, Bordell and Kinzua, and the Bradford, Eldred and Cuba Railroads. It was completed and opened on Sept. 13, 1882, and leased to the BB&K at an annual rental of $1, plus the cost of maintenance. It owned 2 cars.

The details of financing the construction of the RC&E are given on page 00 under the BB&K. It was under the control of the NYLE&W from 1883-1885, along with the BB&K and the BC&E.

The officers were the same as those of the BB&K, viz.:

Pres. J. J. Carter (p. 66)
Vice-pres., R. G. Taylor—BULLETIN 76 (p. 56)
Sect.-treas., B. C. Williams (p. 72)

In 1884 there was the same change in officers as on the parent BB&K, with J. E. Ransom becoming secretary, George A. Eckbert, treasurer, and W. R. Dieffenbach, auditor.

The Rew City and Eldred was abandoned in 1893, at the same time as the Bradford, Eldred and Cuba and its leased lines. In its short life it had served its purpose, and there was no need for its further existence.

BIG LEVEL AND KINZUA

The Big Level and Kinzua Railroad Company was chartered on Aug. 27, 1881, with a capital stock of $150,000, for the purpose of building a 3-ft. gauge line, passing in part through the valley of Kushequa Creek, between Ormsby Jct., on the Bradford, Bordell and Kinzua, and Mt. Jewett, the northern terminus of the narrow gauge division of the Pittsburgh and Western. (According to the "Warren Mail" for Aug. 16, 1881, the road was organized at Kane, to build a 12-mile extension for the NYLE&W, who at that time controlled the BB&K.) This line would afford a connection between the oil fields of northern Pa., and the Pittsburgh district. The road was built by Elisha K. Kane and five stockholders of the Pittsburgh and Western RR. The road was opened in Dec., 1886. A new industrialist and railroad promoter appeared on the scene in the person of Elisha Kent Kane, whose residence was at Kanesholm. He owned considerable forest and other interests in this section, and had erected several chemical and glass plants and kilns in and about the village of Kushequa. He built the Mt. Jewett, Kinzua and Riterville RR and was very active in this territory for a number of years.

Mr. E. O'N. Kane, Jr., writes: "It was my grandfather, (Gen. Thos. L. Kane), not my father, (Elisha K.), who started to build a narrow gauge railroad from Kane to Mt. Jewett, making a connection with the Pittsburgh and Western at Kane, and with the Erie and BR&P at Mt. Jewett. He never completed this construction, but according to a photostatic copy of a letter which is in the possession of the B&O, he agreed with the Pittsburgh and Western, under certain conditions, to turn over to them for completion the line to Mt. Jewett from Kane. My father did the surveying for this right-of-way, and so far as I know, that was his only connection with it." (But all the Poor's Manuals, as well as Scudder, list Elisha K. Kane as president.)

The Big Level and Kinzua was situated on the south side of the Buffalo, Rochester & Pittsburg as far as 1.5 mi. east of Mt. Jewett station; at this point it turned west, crossing the BR&P at grade. It crossed the Erie by an overhead bridge about one mile east of the station, and then turned south and ran parallel to both lines. The BL&K actually ended 0.5 mi. west of the original Erie-P&W depot at Mt. Jewett. Mr. Kane always retained rights to use the yard at Mt. Jewett, and laid a third rail to the station, so his trains could use its facilities.

It was leased permanently to the Bradford, Bordell and Kinzua RR Co., and operated by them under a joint traffic agreement between the BL&K, BB&K and P&W. The BL&K agreed to maintain the road, the BB&K agreed to operate it without charge and pay over the gross earnings, while the P&W, on its part, agreed to forward all freight traffic it controlled, and to pro rate any fares and freight charges received. Despite the apparently favorable terms of such a lease, the financial history appears to be an accumulation of deficits.

The first officers were:

Pres., Elisha K. Kane
Sect., D. I. Hall
Treas., J. D. Brooder

The offices were at Kane.

The lease of the BL&K to the BB&K was discontinued in 1892 when the latter was reorganized, and from 1892 to 1896 the BL&K was operated by the P&W under contract. By this agreement, the P&W supplied the train service at a small amount over the actual cost.

When this traffic contract expired on June 30, 1896, the BL&K was again leased to the BB&K Ry. By the terms of this lease, the BB&K agreed to maintain and operate the road and to pay over 20% of its gross earnings. The lease was for one year, and thereafter, until terminated, on 30 days' notice in writing, by either party.

The officers now were:

Pres., E. K. Kane
Sect., Thos. L. Kane
Treas., Zella E. Kane

For the year ending June 30, 1896, the earnings were $10,630; the operating expenses of $10,132, left a net of $498. Against this was the interest on the bonds of $5,019, leaving a deficit of $4,520. This made the total deficit to date, $23,500. Business seemed to recede, for in the year ending June 30, 1903, the rent received was $639, but expenses of $2,686 left a deficit of $2,047.

There were several changes of officers over the years, only a few of which are recorded here. In 1901, T. L. Kane was the president, C. C. Davis, sect., and E. O. Aldrich, treas. In 1903, S. K. Foote, Jr., of Kane had become treas., and Miss N. C. Cody, of Kushequa, auditor.

After the reorganization of the Bradford, Bordell and Kinzua Ry. to the Buffalo, Bradford and Kane in 1904, the lease of the Big Level and Kinzua was apparently continued as before. However, in 1906 the change of officers on the BB&K appeared on the BL&K, with W. W. Bell BULLETIN 76 (p. 62) as president, and R. S. Bullis (p. 00) as sect.-treasurer.

The Big Level and Kinzua was operated by the Buffalo, Bradford and Kane until the latter was abandoned and thereafter by its own organization. In view of the essentially parallel standard gauge track of the Mt. Jewett, Kinzua and Riterville between Mt. Jewett and Ormsby, there was no longer a need for a narrow gauge road between those points, so the BL&K was abandoned. Mr. R. Davis reports that Mr. S. S. Bullis retained one mile at Mt. Jewett, and built a wye at the west end, which effectually blocked the Pittsburgh and Western from reaching Mt. Jewett except on his own terms. The residue of the BL&K still had trackage rights to Kane (11.50 mi., from the B&O which had taken over the P&W in 1902), including the use of the terminals at Kane, paying 42.5% of the gross earnings as rental. Surpluses were reported as follows: $3,614 in 1908; $6,071 in 1910; $1,321 in 1911.

The stations were: Mt. Jewett, Lafayette, Griffiths, Kanesholm, Kane. Northbound trains left Kane at 7:50 and 10:30 AM, and 2 PM; arriving at Mt. Jewett at 8:30, 11:10 and 2:40, respectively. In the opposite direction trains leaving Mt. Jewett at 12:40, 2:55, and 7:03 PM arrived in Kane at 1:25, 3:55, and 7:40 PM. There was one through train each way between Mt. Jewett and Foxburg, leaving Mt. Jewett at

8:40 AM; from the opposite direction it reached Mt. Jewett at 5:12 PM. All trains were daily except Sunday. At Mt. Jewett the BL&K connected with the Erie; Pittsburg, Shawmut and Northern; Buffalo, Rochester & Pittsburgh; and the Kushequa Route. On Aug. 1, 1911, what was left of the BL&K (about one mile) was purchased by the Baltimore and Ohio and merged with it. They widened the 12.5 miles between Kane and Mt. Jewett during the year. This line is now operated for freight only, on which former Buffalo and Susquehanna locomotives are used, these are well-suited to the hills, sharp curves, wooden bridges, and switchback.

The last train on the BL&K was run on Sept. 30, 1911, with locomotive No. 7. In the picture, the conductor, on the extreme right, is A. G. Kirkwood, brother of D. H. Kirkwood, the present agent of the B&O at Foxburg. There were but two locomotives left when the B&O took over, No. 7 and No. 10 (see p. 79).

ALLEGHENY AND KINZUA

The Allegheny & Kinzua Railroad Co. of the State of New York was incorporated in New York on Dec. 8, 1887. The "Warren Mail" of that date notes that the Allegheny Lumber Co. is to build a railroad south of the mountain, along the river near South Valley, Red House, etc. The Allegheny & Kinzua Railroad Co. of the State of Pennsylvania was chartered in Pennsylvania on Dec. 15, 1887, and the Bradford and Corydon Railroad Co. was also chartered in the same state on May 5, 1886. In the April 17th (1888) issue of the same paper it is noted that the railroad of the Bullis Brothers' Lumber Co. from Bradford to Corydon will connect with the WNY&P at that point, and thus open a new route between Bradford and Oil City. The roads were consolidated on Feb. 26, 1890, as the Allegheny & Kinzua Railroad Co. It was owned and operated by the Allegheny Lumber Co., the purpose of its construction being to get out the lumber in the area. It was built with the standard width. The capital stock was $500,000 authorized and paid in.

The railroad consisted of two main portions, from Red House in New York to Gilbert in Penna. (14 mi.), and from Coffey Run to Bradford (18 mi.) in that state; there were several branches of a temporary nature. While it was expected that the 4 miles from Coffey Run to Corydon would be completed by June 1, 1890, this section was never built. Construction began the first week of Jan., 1888, and was completed in 1890; 24 miles was opened in 1889. The cost of the road was $1,030,040.05. The parts in each state were built separately and operated independently for the first few years; but the whole was operated in close cooperation with the New York, Lake Erie and Western, and the Western New York and Pennsylvania Railroads, under a system of long freight contracts. The business was 99.5% lumber.

The officers and directors were as follows:

Pres., S. S. Bullis, of Ollean—BULLETIN 76 (p. 62)
Vice-pres., Mills W. Barse, of Olean
Treas., Camille Weidenfeld, of Orange N. J.

Frank L. Bartlett, of Olean
John A. Bowers, of New York
John Byrne, of New York
C. S. Cary, of Olean
Peter McNeil, of Buffalo
Isaac B. Newcombe, of New York
George L. Roberts, of Bradford (p. 76)
John E. Rooney, of Olean
Frank Sullivan Smith, of Angelica
Theodore C. Woodbury, of Portland, Me.

Lewis F. Wilson was the secretary. Contrary to most of these early roads, the Allegheny & Kinzua had a directorate from widely separated places. There appears to have been quite a turnover, because in 1896 we find several new directors, only Barse, Bullis, Cary and Rooney having been held over. The new faces were:

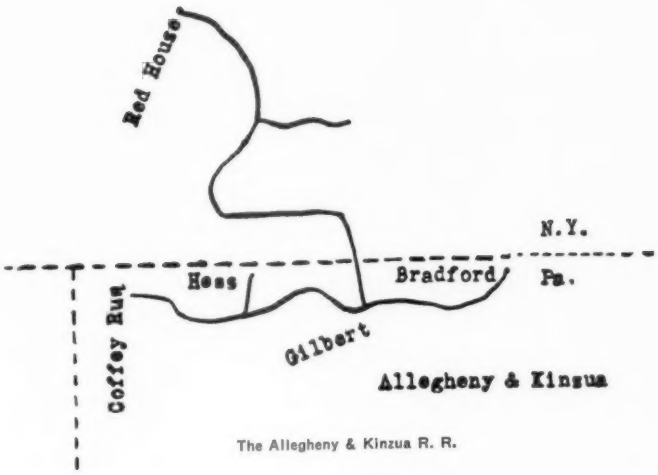
W. J. Bartholomew, of Morrisons, Pa.
C. L. Bedford, of Portville, N. Y.
C. D. Clark, of Olean
E. V. Dunlevie, of Olean
G. C. Farnsworth, of Olean
C. G. Frick, of Olean
G. C. Palmer, of Olean
F. L. Stowell, of Olean
C. D. Williams, of Ridgeway, Pa. (p. 67)

The office was at Olean.

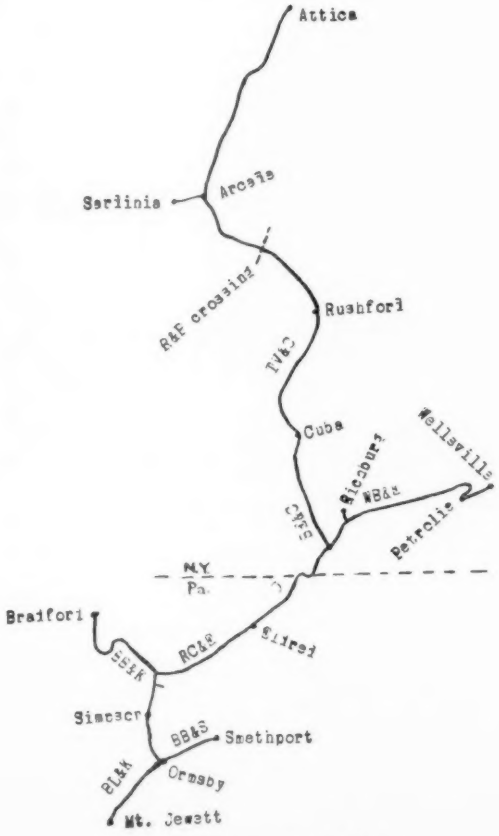
John Byrne was president of the Lackawanna and Southwestern, the succeeding Central New York and Western, and the Pittsburg, Shawmut and Northern until his death in 1904 (see BULLETIN No. 61, p. 79).

Isaac B. Newcombe was the head of Isaac B. Newcombe & Co., Financial Agents, of 54 Wall St., New York.

Frank Sullivan Smith, son of Dr. Wm. M. and Adaline (Weeks) Smith, was born at Short Tract, in the town of Granger, Oct. 14, 1851. Although a child of but ten years of age, he had the opportunity to see something of the war, by reason of passing the latter part of 1861 and the early part of 1862 with the 85th Reg. N. Y. Vols., of which his father was surgeon. From 1865 to 1868 he attended Angelica Academy where he prepared for college. He entered Yale University in 1868, and graduated in 1872. The same year he was elected school commissioner of the first district of Allegany county, and served for one term, until Jan. 1, 1876. Admitted to the bar at Rochester, April 7, 1876, he at once became a member of the law firm of Richardson, Flanagin & Smith at Angelica, and during the next four years took active part in the work of the district attorney's office, his partner, C. N. Flanagin, being district attorney. He was especially active in the cases of the People *vs.* Babcock and People *vs.* Hendricks. He took entire charge of the second trial of the first-mentioned case and secured a conviction, and, in the second, he had charge of the surgical work of the case. He also assisted in the defense of the indictments for murder in Livingston county, in the cases of Pierson and Withey. He married, Oct. 17, 1877,



The Allegheny & Kinzua R. R.



The "Erie" Narrow Gauge System

Miss Clara A. H. Higgins, daughter of O. T. Higgins, Esq., of Rushford. He was attorney for the Genesee Valley Canal railroad company, during the construction of the road between Olean and Rochester, and for its lessee, The Buffalo, New York and Philadelphia Railroad company, and its successor company, from 1881 until 1887. He was president and general counsel of The (first) Allegany Central Railroad Company, vice-president of the (second) Allegany Central, until its consolidation with The Lackawanna & Pittsburgh Railroad company in 1883, and was vice-president and general counsel of the latter until December, 1884. In the spring of 1887 the trustees of Cornell University invited him to take charge of the law school of the University as its Dean. He declined the offer preferring to remain in the active practice of his profession. He was delegate to the Republican National Convention of 1884, secretary of the Republican State Committee 1887 to 1891, general counsel of the Scioto Valley and New England Railroad company from its formation until its absorption by the Norfolk & Western Railroad company in 1890, and attorney for the receivers of the Richmond and Danville Railroad company 1893 and 1894. He was vice-president and general counsel of the Lackawanna and Southwestern and succeeding Central New York and Western Railroad company. He was successively a member of the Law firms at Angelica, of Richardson, Flanagin & Smith; Richardson & Smith; Richardson, Smith & Robbins, and Smith, Rockwell & Dickson. In the fall of 1887 he opened an office for the practice of law at 48 (later, 54) Wall Street in New York. After opening his New York office he had charge of much important litigation, notably in relation to the East and West Railroad of Alabama, the Schuyler Electric Company of Connecticut, the Pittsburgh, Shenango & Lake Erie Railroad Company, the Michigan Gas Company and the Allegany & Kinzua railroad company, in all of which he was successful. He was a member of the State Bar Association, the Bar Association of the City of New York, and of the Society of Medical Jurisprudence, of which he was a trustee. He became president of the Pittsburgh, Shawmut and Northern on the death of John Byrne in 1904, just in time to be appointed its receiver on Aug. 1, 1905. He died on Nov. 15, 1920.

Frank L. Stowell was born in Olean in 1861. His father, who had the same name, was a prominent business man in that community. Young Frank was educated there, and was always interested in the lumber business. He was appointed postmaster of Olean in 1894.

Weidenfield was also a director of the Central New York and Western at this time.

As previously stated the Red House division, at first was operated separately; it then had 1 locomotive and 25 cars, while the Penna. division had 3 locomotives and 20 cars. There were 5 locomotives on the road in 1890.

In 1892 the N. Y. State railroad commissioners stated that the road had 3 locomotives,* one each of 4, 6, and 8 drivers, and 95 cars, and that

*In 1896 they reported 1 8-drivered and 2 4-drivered locomotives.

it ran "through a wild and uninhabited country," full of lumber. The general superintendent was then C. V. Merrick, p. 62—BULLETIN 76.

The stops ** were Red House, Hideckers, Percivals, Banks, Stevens, Stoney Branch Jct., Remington, English Brook, Frecks, Yeagers, Schoonmaker, Murray Hill, Gilbert Jct., Wilsons, Smith Jct., Bradford The Branch had Coffey Run, Ostrander, No. Branch (to Hess Mill), Sugar Run, Gilbert Jct.

Early operations were very remunerative. In 1891 the net earnings were $24,848.61 and the surplus amounted to $21,411.11. This good fortune could not be kept up. The Allegheny & Kinzua went into a receivership on Feb. 1, 1892. A. D. Scott, of Buffalo, was appointed as receiver; he died on Mar. 7, 1897, and the court appointed L. I. Lewis interim receiver until F. W. Kruse, of Olean, was given the permanent position on Apr. 13, 1897. In the report of operations, dated June 30, 1896, there was a small deficit of $831., reducing a previous surplus to $2,026. The road was closed on June 16, 1897, and it was announced that the road would probably be abandoned shortly. Since the lumber had been exhausted, and there being no other traffic, it was abandoned in 1898.

Acknowledgment: the biography of Frank Sullivan Smith was largely taken from a History of Allegany County, published in 1896 while the subject was living.

SUGAR RUN

The Sugar Run RR. Co. was organized on Nov. 10, 1891, to build a 14-mi. standard gauge road between Shaffer's Dock and Sugar Run. The road was completed to its maximum extent by 1894. In order to reach Bradford, the Sugar Run negotiated an agreement with the New York, Lake Erie and Western for trackage rights over 10 miles of the latter's West Branch. The Sugar Run on its part agreed that all of the business beyond its own line should be handled by the NYLE&W. This agreement is mentioned in the Annual Reports of the Secretary of Internal Affairs of Pennsylvania and in some Poor's Manuals, and the ten miles was said to be between Bradford and Allegheny Jct. But there was no such place on the West Branch; the only Allegheny Jct. found on the contemporary maps available is on the Allegheny and Kinzua! This apparent discrepancy might be explained provided that the Sugar Run had a branch from its main line to the A&K. Such a branch would also account for the terms of the above agreement to utilize the NYLE&W for all freight—it is difficult to see the need of such an agreement otherwise, for there would be no alternative outlet.

Mr. Townsend of the Erie RR. Co. writes: "As a matter of information an old agreement of 1888 between the NYLE&W and the Allegheny and Kinzua refers to the West Branch Road as extending from Sugar Run to Bradford, and recites that the A&K is about to construct a line

** In regard to Allegheny Jct., see under the Sugar Run.

of railroad extending from some point near the terminus of the West Branch Road to certain timber lands in the Townships of Corydon and Bradford, Pa. and in the county of Cattaraugus, N.Y. (see p. 83). It further provided for a connection being made with the West Branch Road and for the through transportation of freight and passengers from points on the A&K to points reached by the Erie and its connections, but a later agreement, made in the same year, provided for the A&K building its own line from the present terminus of the West Branch Road in Corydon Township to a point near the Chemical Works Switch in Bradford so as practically to make a connection with the Erie Road at the Chemical Switch.' ''

The officers and directors were as follows:

Pres., W. I. Lewis
Vice-pres., A. A. Healy, of New York
Sect., L. E. Larabee, of Coudersport
Treas., Frank Healy
Genl. Supt., C. V. Merrick, of Bradford—BULLETIN 76 (p. 62)
George E. Brown, of Wellsville, N. Y.
M. L. Gridley, of Coudersport
D. H. Jack of Bradford—BULLETIN 76 (p. 62)
W. K. Ronnseville, of Coudersport
J. F. Stone, of Coudersport

The Sugar Run was owned by the U. S. Leather Co. In 1896 an 8-mile segment from Allegheny Jct. to Allen's Camp was reported. By 1897 many of its officers were the same as those of the Tionesta Valley Ry., but there is no indication that the leather company controlled the latter. The officers and directors were now as follows:

Pres., Isaac Horton, of Sheffield
Sect., *R. G. Brownell, of Sheffield
Treas., J. R. Plum, of New York
*H. A. Crary, of Sheffield
Jerry Crary, of Sheffield
*James H. Horton, of Sheffield
*B. McOwen, of Clarendon
C. W. Radeker, of Sheffield
F. H. Rockwell, of Warren

Those marked with an asterisk (*) were also officers of the Tionesta Valley, J. H. Horton being president. One of the early directors was an L. H. Lapham. Merrick was still the general superintendent, but the office had been moved to Sheffield.

At its greatest extent (10.5 miles) the Sugar Run extended from Shaffer's Dock to Ostrander. It owned one locomotive. In 1896 it reported a surplus of $2,158, which made a total of $7,580.

The Sugar Run was abandoned on Jan. 1, 1898.

Short History of the Denver & Rio Grande Western Ry.

By V. A. Farrell

(A Paper read before the New York Chapter of the Ry. & L. H. S., November 16, 1945.)

The invitation to speak to this distinguished gathering comes at a particularly appropriate time for I was fortunate enough to have had the privilege of participating, at the end of last month, in the 75th Anniversary celebration of the organization which I represent in this city, the Denver and Rio Grande Western Railroad. In the course of observance of the Anniversary, much of the history of the road was reviewed both in speeches by men who have for many years been associated with its development and by stories in the newspapers of the territory which it has served for so long a time. It is my intention this evening both to review some of the highlights of the Rio Grande's colorful past and to discuss some of the factors which make the railroad today a vitally important link in the nation's transcontinental rail system.

Strangely enough the Rio Grande had its beginnings during a national period not unlike today. Such are the marvels of modern communications and transportation that in 1870 even though five years had elapsed, Civil War reconstruction was no further advanced than reconversion since V-J Day is now. Just as the great achievements of our present will someday be credited to restless veterans of World War II whose vision has been expanded by their participation in a world upheaval, so it was that daring Civil War veterans led the way across the continent seventy-five years ago. Such a man was General William J. Palmer. He had left his important post with the Pennsylvania Railroad to serve with distinction throughout the Civil War. In August, 1865, he became Treasurer of the Union Pacific, eastern division. Name of the company was formally changed to the Kansas Pacific Railway Company in April, 1869, when General Palmer chose to manage construction of the road into Denver. He was not satisfied, however, to call his work finished when the Kansas Pacific was completed from Kit Carson to Denver. He visioned a trunk line from Denver to Mexico City, a gigantic and daring proposition which was formally inaugurated with incorporation of the Denver and Rio Grande, October 27, 1870. Since the projected route was clearly defined along the Rio Grande del Norte, it was natural that its name should indicate the initial point and some principal objectives. Hence the original designation Denver and Rio Grande.

Let us bear in mind that the history of the Civil War reconstruction for an entire generation was written in terms of railways. Then let us glance at the picture of Denver in 1870. The whole population of the territory of Colorado was less than 40,000 persons, and Denver consisted of a town of 4,800 people. A few hundred people were collected in a settlement at Golden, 12 miles west of Denver, and Boulder,

about 30 miles to the north, was but little, if any larger. The town of Colorado Springs was not in existence, while Colorado City had a population of 300. Probably 500 or 600 people had collected at the base of the mountains in the Las Animas Valley at Trinidad. The largest community in the whole western interior region was Sante Fe, New Mexico, the resident population of which is recorded as about 8,000. There were, of course, a few isolated settlements not far removed from the margin of the Great Plains, but these comprised people of itinerant characteristics and few, if any, permanent communities later resulted therefrom. Farther west the Mormons had settled in the great basin on the shores of the Great Salt Lake and started building Salt Lake City.

In Denver itself there was great gloom when the Union Pacific, upon which Colorado promoters had banked so heavily, by-passed the territory. There were dire predictions that Cheyenne instead of Denver would become the metropolis of the Rocky Mountains. But these "purveyors of Doom" reckoned without the ingenuity of the Colorado promoters and the sagacity of Eastern and European financiers.

They reckoned without Dr. John Evan, the Ohio Quaker, who in spite of obstacles succeeded in pushing the Denver Pacific Railway to a connection with the Union Pacific in 1870. They underestimated the drive and tenacity of W. A. H. Loveland, the genius behind the project to make Golden the railroad center of the Rockies, and builder of the Colorado Central Railroad. Unknown as yet was the organizational ability of Otto Mears, the Russian immigrant whose toll roads honeycombed the gold and silver camps of the San Juan region, and who soon was to become one of the leading railroad builders of the West. As yet unappreciated were the activities of Alexander C. Hunt, former Governor of Colorado and the pioneer real estate and railroad promoter of the territory. The genius of David Child Dodge, and the spectacular ability of David H. Moffat, were as yet unproven though both were ardent workers in the vineyard during the 'Seventies.

The whole region was essentially a territory primeval and, as such, and also because of the fact of its remote and isolated position with respect to what was then considered the civilized world, its exploitation was indeed a bold and courageous undertaking.

The financing of a railroad project under such conditions was fraught with utmost difficulty. Returns on investment were, because of the sparsely settled region, very problematical to say the least. Such a project must develop its own revenue, so to speak. Cost of construction was excessive. Manufactured articles had to be transported over long distances and at high tariff rates. In 1870 tolls exacted for the carriage of freight from Omaha, Leavenworth, or Kansas City to Denver were $2.60 per hundred weight on merchandise, $2.00 per hundred weight on second class freight, $1.75 per hundred weight on third class, and $1.40 per hundred weight on fourth class. It cost $9.10 to send a ten word telegram from Denver to New York, $9.25 to Boston, and $7.50 to Chicago or St. Louis. Rails must needs be imported from England, the nearest accessible seaport served by rail communication being New

Orleans, almost 1,900 miles away. Common labor was paid from $2.00 to $2.50 per day, but was so scarce that miners were used to a considerable degree as a substitute at $3.50 per day and upwards. Living expenses were proportionately as high above the average of the States as were the wages and other costs. It was in this sort of a stage setting that Denver & Rio Grande had its origin.

It was partially because of the difficulty in securing funds that the novel expedient of adopting a narrow gauge of track was resorted to. The assurance of economy in construction of the narrow gauge railway, coupled with the confident conclusion that a standard gauge was impracticable, and in certain cases impossible, for serving a territory consisting of the most precipitate mountain region within the confines of the Nation, led to the undoubted advisability of utilizing the 3'0" gauge for a railway track. Its adoption not only won for the Rio Grande the nickname of the "baby road" but also resulted in one of the most heated controversies in American railroad annals. Engineers, promoters, and executives throughout the nation engaged in the debate which at times was more than acrimonious. Newspapers, magazines, and trade journals in both America and Europe joined in the controversy which found many prominent railroad men in agreement with General Palmer.

Another remarkable factor in the building of the narrow gauge road was that it was built entirely without subsidy from either state or county governments and without a federal land grant in the public domain. In an era in which millions of acres of land throughout the west —including hundreds of thousands of acres within Colorado—were given as a subsidy to the railroads by the Government, Palmer and his associates succeeded in financing their road entirely by private capital. In place of the usual grant of alternate sections of land in the public domain, the narrow-gauge associates purchased large tracts of land at specific locations along the proposed right of way. These they later developed and sold as colony grants for the support of the railroad. By this means Colorado Springs, South Pueblo, La Veta, Alamos, and a score of other communities were founded. Large coal and iron deposits were located and purchased for exploitation by the railroad and its associated land development companies. British and Dutch finance made possible the narrow-gauge road, but the foresight and energy of General Palmer, Dr. William A Bell, William S. Jackson, Charles and Robert Lamborn, David C. Dodge, and others pushed it to fruition.

Grading on the Rio Grande was begun in March, 1871, but owing to delay in delivery of rails from Europe, the track was not completed to Colorado Springs until October 27. Weather conditions that fall prevented opening of this section of line until January 1, 1872, on which date the grading for the second section, namely, between Colorado Springs and Pueblo, was begun. The track was completed to Pueblo, 118 miles from Denver, June 15, 1872, and pushed westward to reach the coal mines in Fremont County, by November 1 of the same year. The severe financial crisis of 1873, which threw seventy-seven U. S. railroads into bankruptcy, only temporarily delayed the expansion of the Rio Grande. Canon City to the west was reached in 1874 and El Moro, four miles from Trinidad to the south, in 1876. It was now

ready to lay rails over Raton Pass and tap the Rio Grande river valley, but prominence of the Leadville district as a mineral region created a clamour for transportation which could no longer be ignored. The Rio Grande chose to follow the march of men into the Rockies, and all efforts were centered on extension west from Canon City.

Probably the most dramatic chapter in the 75-year history of the Rio Grande was written in the awesome depths of the Royal Gorge where, through the course of millions of years, the sand-filled water of the Arkansas River had gradually sawed a narrow cleft eleven miles long and more than 1,000 feet deep through the solid rock escarpment of the plateau towering above the edge of the plains at Canon City. With rich strikes of gold at Leadville in 1877, this spectacular defile became the scene of a titanic struggle between the Rio Grande and the Sante Fe. Throughout the 116-mile course of the Arkansas from Canon City to Leadville's gold diggings was an easy water grade for a railroad. The Royal Gorge, only thirty feet wide in some places, provided barely enough room for one railroad alongside the erratic river; two were simply out of the question.

The Royal Gorge "war" was formally declared on April 19, 1878, when both railroads' companies simultaneously sent grading crews into the Gorge. Accounts differ from that point forward, but it is known that both outfits had armed guards, and that many shots were exchanged, without any casualties "of record." Stone forts were erected, some of which still stand.

Most of the actual "battle" was fought in court, however, and the final legal gun was fired in February, 1880, when the Santa Fe agreed not to build west of Canon City for ten years. Echoes of the final salvo of writs of mandamus had scarcely died away before General Palmer's crews were hard at work driving a fanwise network of slim gauge tracks at incredible speed through the mountains, and by July 20 the first train pulled into a hysterically celebrating Leadville.

Once the eyes of its founders had been turned west, every possible location through the mountains was surveyed, as the Rio Grande laid rails to almost every spot in the mountain region where mining development demanded transportation. The spirit of high adventure lightened hardships, the romance of achievement bolstered bold courage, the empire of the Intermountain West was reclaimed from a territory described in the 'Sixties as an "impenetrable wilderness." Serving more of Colorado than any other railroad, the Rio Grande blankets southwestern Colorado, northern New Mexico and north central Utah with a network of steel highways.

Progress was rapid after 1881. The line from Leadville was extended west over Tennessee Pass to Glenwood Springs, but the original main line crossed Marshall Pass at an elevation of 10,856 feet, following the Gunnison River to its confluence with the Colorado at Grand Junction near the Utah border. In Utah, the Rio Grande Western, closely affiliated with the parent company, was formed in 1881. Small disconnected lines in the Salt Lake City region were unified and new lines

were pushed east toward the Colorado border. The through narrow gauge railroad, Denver to Ogdon via Marshall Pass, 756.6 miles in length, was placed in operation May 21, 1883. It was thoroughly equipped with elegantly appointed passenger cars, including both standard and tourist Pullmans. So well was the new service received, that travelers christened the Rio Grande "Scenic Line of the World," a designation now universally recognized.

Wherever veterans of Colorado railroading meet there are the inevitable stories of run-away trains, ghost locomotives and strange accidents. One oft-repeated tale is that of the engineer on the Rio Grande Silverton branch who while descending the precipitious road discovered that two link and pin couplings had broken. The brakes on the locomotive failed to work and only on the last few cars had the trainman been able to set the manual brakes. The engineer took matters in his own hands. He gave the locomotive full throttle in order to outdistance the rapidly pursuing sections of his freight train. On reaching level territory he was able to apply the locomotive brakes and enter a siding—just in time to gasp with relief as the engineless sections of the freight train flashed past him on the main line. Fortunately, in these days there were few towns along the right of way and no damage was done. The run-away cars, reaching the end of the decline soon slowed down and stopped. Nonchalantly the train crew recoupled and continued their journey. Such stories require no proof. They are part of the legend of a colorful period before the introduction of air brakes and other modern safety devices.

A classic story among old timers in the Alamosa Division concerned an engineer named Schmidt. Schmidt was an immigrant and had worked on railroads all over this country before coming to Colorado. He had a reputation among the men for getting into trouble and so it was not wholly unexpected when one day he turned up missing. Upon investigation the division superintendent discovered the reason for this unexplained absence. Schmidt was in the cab of one of the old narrow gauge locomotives, which the men usually referred to as the "tea-kettle," and was making his usual run on the Alamosa-Durango line. Somewhere south of Alamosa he saw a cowboy driving a large band of horses toward a loading chute along the railroad right-of-way. The cowboy was evidently having considerable trouble keeping the band of horses in one group. Schmidt, without warning, playfully reached up and pulled the whistle. The shrill blast cut the clear air and re-echoed for miles around. Naturally the frightened horses broke and ran in all directions. Now Schmidt was not at all satisfied with having pulled the whistle once, but kept pulling it. The "spooked" horses disappeared over the horizon and the unappreciative cowboy lost complete control over his temper. He quickly dismounted, jerked his carbine from its saddle holster, and emptied the magazine into the cab of the locomotive. Fortunately Schmidt was not hit, but the metallic twang of "hot lead" against the walls of his cab convinced him of the wisdom of moving on—bullets and locomotives just did not mix.

Unique and frequently adverse conditions under which trains operated in the Rocky Mountain region made for early adoption of improved equipment and the development of devices designed specifically for use in this region. The Rio Grande was the first western railroad to install air brakes on its freight cars. Development of locomotive power especially for mountainous areas resulted from the problems faced by roads in this region. In 1877 it required four locomotives to haul a five car train over the narrow gauge La Veta Pass. By 1885, a single locomotive was able to do the work of four of its predecessors, and with the aid of a helper engines could haul almost three times the tonnage that had previously been handled. Average tractive effort per locomotive owned by the Rio Grande increased from 6,000 pounds in 1873 to 15,245 in 1890. During that seventeen year period its fleet of locomotives owned had increased from thirteen with an aggregate tractive effort of 78,000 pounds to 301 with an aggregate tractive effort of 4,588,699 pounds.

Standard gauging was imperative as it became evident that the Rio Grande was destined to become an important transcontnental railroad. The Royal Gorge Route, a through standard gauge railroad, Denver to Ogden via Tennessee Pass (10,240 feet elevation), 782 miles in length, supplanted the original narrow gauge route November 14, 1890.

The entire system is now standard gauge with the exception of the lines from Alamosa to Durango, Silverton and Farmington, N. M.; from Alamosa to Salida; from Salida to Gunnison, Montrose and Ouray in central Western Colorado. These lines, 552 miles in length, constitute the longest narrow gauge system in the United States.

During all these years the high front range of the Rockies remained a relentless barrier to Denver's ambition for position on a transcontinental line directly west through the mountains. As early as the first year of the Civil War, Colorado's first territorial governor, William Gilpin, prophesied that someday trains would glide through a great bore under the Continental Divide in the vicinity of James Peak. Such a tunnel could not be privately financed, but the dream persisted and in 1902 David Moffat started building the Denver & Salt Lake Railway, crossing the divide at Corona Pass, 11,660 feet in elevation, then the highest standard gauge railroad in the world. Construction was costly and the extreme expense of operation hindered the new line, which by 1913 reached only to Craig, in northwestern Colorado, far short of its Utah objective.

Then came decision by the people in the Denver area to finance the Moffat Tunnel. The great bore, 6.2 miles in length, was started in August, 1923, and was completed in February, 1928.

Denver's ambition for a direct transcontinental railroad was realized June 17, 1934, when the Denver and Rio Grande Western completed the Dotsero Cutoff, a new thirty-eight mile railroad along the Colorado River connecting tracks of the Rio Grande at Dotsero, and the Moffat road at Arestod (Dotsero spelled backwards).

With inauguration of service via the Moffat Tunnel Route the Denver and Rio Grande Western made good a prophecy which had remained only a dream for seventy-five years. Finally the last barrier of the mountains was conquered. The direct transcontinental railroad, Denver to Ogden, 606.9 miles in length, became a reality.

No single factor has meant more to development of the intermountain West; no railroad more adequately serves its local territory. The Rio Grande is a vital link in the several great transportation chains making up the direct central transcontinental routes. Through Salt Lake City and Ogden people and goods are transported to and from the Pacific Coast; the Royal Gorge route via the Pueblo gateway most important to Kansas City and St. Louis; the Moffat Tunnel route via the Denver gateway most important to Omaha and Chicago.

Such was the Rio Grande picture in 1935, when the vicissitudes of fortune finally forced the road into trusteeship and Judge Foster Symes appointed Wilson McCarthy and Henry Swan to operate the property. There were two splendid routes. The Rio Grande was ready to make a serious bid for full scale transcontinental recognition. Obviously, to attain a satisfactory competitive position, vast physical improvements were necessary. Rio Grande needed a heavy-duty, high-speed roadway; it needed power and equipment second to none. Given this parity with competitors, it could solicit transcontinental business with assurance that satisfactory service would retain patrons.

Thus it is that during the past decade a total of more than $64,000,000 has been poured into improvements of the Rio Grande's physical plant. Heavy duty, high-speed roadway is a reality. Rail replacements have been made at the rate of $1,000,000 per year between 1935 and 1942 and $900,000 per year between 1942 and September of this year. Much of this rail weighs 131 pounds per yard, a far cry from the original 30 pound Sheffield steel over which the first through train from Denver to Ogden ran in May 1883. Of more than passing interest is the fact that Rio Grande trains glide through the Moffat Tunnel on continuous jointless welded 130 pound rail, utilizing a full-fusion weld which greatly minimizes track upkeep in the tunnel.

Most dramatic of the entire story of the Rio Grande progress is the evolution in power. Old engine 168 which pulled the first through train in 1883 exerted a tractive effort of 11,590 pounds. Twenty times more powerful are the giant 5,400 horse-power diesel electric locomotives of today which exert an initial tractive effort of 229,700 pounds. Expenditures for power and equipment have reached amazing totals.

Early in the trusteeship, it was decided to establish a research and testing laboratory. Well equipped and manned by eminent scientists this laboratory has become the outstanding railroad research laboratory of the nation. New techniques and materials have been developed and have been adopted by many other American railroads. For example, photo-elastic equipment has enabled the research staff to redesign the materials in order to minimize stresses. Radically new rail section with an inverted web has been designed and will be free of the fillet

cracks which have given difficulty with the old design. A new technical process known as the "streaming double refraction method of fluid flow" was developed in studying design of locomotive fire-boxes. This process has attracted wide-spread attention and is being applied to a wide variety of problems in research laboratories of the aeronautics, hydraulic, steel, and other industries.

The modern magic of centralizing traffic control has been most thoroughly applied by the Rio Grande. Train order and time table authority is abolished and trains move by the indication of block signals remotely controlled. Passing track switches also are controlled by the dispatcher. The Rio Grande has more CTC in proportion to its main line mileage than any other Class 1 road in the country, and with the completion of two projects now under construction, the entire main line from Denver to Salt Lake City via the Moffat Tunnel route, with the exception of the double track over the Wasatch Range in Utah, and the 38-mile Dotsero Cutoff, will be CTC operated.

The miracle of radio communication now makes possible cab-to-caboose and train-to-station communication. Just as many years ago physical conditions on the Rio Grande provided the ideal testing ground for development and improvement of air-brakes, so today the variety of physical conditions encountered on our line provide radio experts ideal territory in which to answer the problems confronting them in perfecting this type of radio communication.

The ultimate aim of the entire improvement program has been and still is to render better service to shipper and traveler. To improve the Rio Grande's competitive position—we undertook to get our house in order so that we could respond to the schedules and delivery of merchandise on a basis of equality with the best railroads in the United States. That result, happily, has been attained. It is common knowledge that Rio Grande traffic has vastly improved since the Moffat Tunnel route came into existence.

Thought of the founders was that the Rio Grande could exist and prosper merely by serving its own territory. The error of that thought was early discovered but was never quite so thoroughly emphasized as it has been during the war years, when Rio Grande took its place as one of only seven transcontinental systems serving the vast area of the United States between the Middle West and Pacific Coast. Far exceeding even the fondest hopes of those who predict traffic load, it carried its full share of the military burden. This, of course, brought a demonstration of the potentialities found in bridge traffic, that is, traffic received by the Rio Grande from another carrier at one end of the line and delivered to another carrier at the other end. In 1918, at the height of World War I about 11½ million tons of traffic originated on line and about 2½ million tons were received from connections. In 1944, at the height of World War II, well over 10 million tons of traffic were received from connections while slightly over 8 million tons originated on line. These significant figures show that the Rio Grande in truth can now fulfill the role dreamt of by those who like to look upon it as a vital link

in a great chain of railroads which make up the transcontinental systems.

Not for a single moment should it be thought that the Rio Grande has lost interest in its own territory. The stronger its position as a transcontinental line becomes, the greater becomes its value to its own territory. The great San Luis Valley, America's Roof Garden, is local Rio Grande territory and annually produces between 10 and 11 thousand cars of perishable products. The Western Slope area with vital Rio Grande branch lines reaching into Delta, Montrose and Ouray counties is another jealously guarded source of Rio Grande traffic where last year peaches from Mesa and Delta counties reached an all-time high of 3,138 cars.

Colorado and Utah sheep and cattle are world famous. No railroad in America per mile of track carries more cattle, sheep and wool than does the Rio Grande. Mining districts, including the legendary names of Leadville, Silverton, Ouray and Gunnison in Colorado, and equally prominent names like Park City, Silver City, Tintic and Bingham Canyon in Utah contribute heavily to Rio Grande freight traffic. In fact, when the entire story of the atomic bomb is told, it will be found that Rio Grande cars carried the most vital elements of the atomic bomb because of the fact that uranium is produced in Colorado in greater quantity than anywhere thus far known.

The Rio Grande is part of the warp and woof of Colorado and Utah. It always has, does now, and always will do everything in its power to develop its territory, to help its producers find markets for the things they grow and manufacture.

While narrow gauge mileage has shrunk, the narrow gauge system still in existence has been improved to keep pace with the modern main line it serves. To illustrate this point, the old Montezuma engine, the locomotive by which this railroad profited 75 years ago had tractive effort of 2,750 pounds. The present K-37 class of engine now in narrow gauge operation has tractive effort of 37,100 pounds. In other words, today's narrow gauge locomotive can haul more than 13 times as much freight as could the original Montezuma.

Progress does not stop. Rio Grande now has on order six lightweight, stream-lined passenger trains which will be in daily service between the Middle West and the Pacific Coast. They will embody every new idea for passenger comfort and convenience, and will feature the Vista-Dome cars, which will give passengers full opportunity to see and to find inspiration in the matchless scenic wonders of Colorado and Utah.

No railroad in America possesses a more glamorous past than does the Rio Grande. It has been a powerful factor in developing Colorado and Utah, and will continue to play a dominant role in the years that lie ahead. It is proud that pre-war preparation made it possible to meet the tremendous demands imposed by war. It has emerged from the war with the finest physical plant in its history. It is manned by a personnel of 10,000 railroaders who know exactly what to do with that plant to

keep it in the fore-front among American railroads. The loyalty, efficiency and devotion to duty shown by these men and women prove that the human factor is, after all, a factor upon which any business must rely for success or failure.

The future beckons us. The first seventy-five years of Rio Grande existence have served to give us a confidence and faith and courage which enables us now to look ahead to brighter and better days.

New Books

THE SAPBUSH RUN, AN INFORMAL HISTORY OF THE BLACK RIVER & UTICA R. R., by Thomas C. O'Donnell, 156 pages, 8¼ x 5¼, illustrated, bound in cloth. Published by Black River Books, Boonville, N. Y. Price $2.00.

This is the story of the trials and tribulations of an "up-state" New York railroad. It was the original intention to connect Utica with the St. Lawrence River but, after its completion to Boonville, a distance of thirty-four miles, with funds exhausted, the latter remained a terminus for several years, the little village making the most of its opportunities during the while. It was not until after the Civil War that the road was finally extended northwards and was subsequently taken over by the Rome, Watertown & Ogdenburg, R. R.

The road was never of trunk-line importance, though thanks to Daniel C. Jenne, its Chief Engineer, it was well located, with a view to winter's snows and well built. The chief value of this book lies in the fact that the author, through careful research, has not only outlined the conception of the road but the various ruses resorted to by the New York town in the Mohawk Valley to secure its terminus. He has recounted the local hands that manned the trains and the men and women who rode them; the stampede of the horse drawn vehicles when the engine snorted into town and the brawls of the lumber jacks in the depot waiting room; the picnic parties to Trenton Falls and the ladies and gentlemen that made the sojourn to New York with enough conversational material to last them the rest of the winter. The book is a fine contribution to American folkways in addition to that of a railroad history and is one that will be relished by all of us. It could well serve as a pattern for others.

GEORGE STEPHENSON, FATHER OF RAILWAYS, by Ada Louise Barrett, 287 pages, 8 x 5¼, illustrated, bound in cloth. Published by The Paebar Co., 300 West 55th St., New York (19), N. Y. Price $3.75.

The subject of this book needs no introduction to any member of this Society. Sufficient to say the author has produced a readable and highly interesting account of this distinguished Englishman. The majority of our membership are already familiar with the author's account that appeared in our BULLETIN No. 71 and this account covered the high points in the life of this great engineer and inventor. For a young man to reach the age of 18 without even knowing the alphabet seems almost incredible in these times, his successes speak well of his diligence and ingenuity. It is not the purpose of this review to enumerate all his successes here but the three things that made his "Rocket" a success at the Rainhill trials have been incorporated in every successful steam locomotive built to date. It is a book that every American boy might well read to show that work and determination can and will win and it is a book that should interest all of our members.

CENTENNIAL HISTORY OF THE PENNSYLVANIA RAILROAD COMPANY, by George H. Burgess and Miles C. Kennedy, 835 pages, 8⅝ x 5½, illustrated, indexed, bound in cloth. Published by the Pennsylvania R. R., copies may be obtained from the Union News Co., price $3.50.

On April 13, 1946, the Pennsylvania Railroad had rounded out 100 years of service to the American public and this nation and this book is a commemorative of this service by the road that carries more freight and more passengers than another other in this country.

Its form of presentation follows that of the several executives of the railroad, probably the only way in which this history could be presented without considerable duplication. Probably more than any one of these, to shape the destiny of this road was John Edgar Thomson, President during the years 1852 to 1874.

The Pennsylvania has always been conservatively but well managed; it was the first to use steel passenger equipment in large numbers and it pioneered in other equipment, devices and standards of right of way. It has always paid a cash return to its stockholders since 1847. It is not within the scope of this review to tell you what the Pennsylvania R. R. is but this book, covering one hundred years of this transportion enterprise is not only a tribute to this carrier, it is one that is well worth owning by all of us.

VIRGINIA & TRUCKEE, A STORY OF VIRGINIA CITY AND COMSTOCK TIMES, by Lucius Beebe and Charles Clegg, 59 pages, 9 x 6, illustrated, bound in cloth. Published by Grahame H. Hardy, Oakland, California. Price $2.00.

With the recent proposed abandonment of this road, this book has made a most timely appearance. Its authors have captured a great deal of its romance in the by-gone days, when silver was king of the Comstock, when Big Bonanza was in operation and traffic so heavy on this little road that trains were running night and day with their precious freight. Eighty years has seen many changes.

In the mind of this reviewer are several items that stand out. The authors have presented a gallery of fine photographs, not only those taken themselves but in selecting from the material of others; the decorations of E. S. Hammack and the maps by Frederic Shaw add much in value as well as in delight to the reader. The roster of locomotives and equipment, together with their disposition adds the final touch in completeness. No matter whether you have ever ridden over the Virginia & Truckee or not, you have certainly heard about it and, you should add this book to your library.

GRANGER COUNTY, A PICTORIAL SOCIAL HISTORY OF THE BURLINGTON RAILROAD, by Lloyd Lewis and Stanley Pargellis, 425 illustrations, pages 10½ x 7¾, bound in cloth. Published by Little, Brown & Co., 34 Beacon St., Boston (6), Massachusetts. Price $5.00

This book, as suggested by its title is a pictorial history, not only of this railroad but of the country that it serves, portraying the tremendous drama of the west across America. Drawn from all sources, they portray the corn-and-hog country, the cattle ranges, the wheat and beet

fields and the cattle and sheep ranges— the "bread basket" of this great country. Yes, you will find plenty of the railroad amongst them but the book goes beyond the line of track and goes into the vast areas it serves and shows how it has influenced the lives of our people, and can anyone after viewing the illustration entitled—"Granger Products" fail to realize that our railroads and this railroad in particular had much to do with producing them? The Burlington, as you all know from the articles in our own publication, is celebrating its centennial year and this book is a fine tribute, in pictorial fashion of this outstanding western railroad, the people and the section of this country it has served so well.

Formation of the New England Railroad Systems

The Harvard University Press has requested that we announce to our membership the publication, unrevised, of the first edition of this book. Originally published in 1937, this was Prof. George P. Baker's thesis for his doctor's degree, in which your Society was a joint sponsor.

The book traces the growth and formation of our larger New England railroad systems up to the turn of this century. There is a chapter devoted to the Boston & Albany R. R. Three chapters including one on the Old Colony, another on the New York & New England and another on the N. Y. N. H. & H. and C. N. E. cover the New Haven group. For the Boston & Maine there are chapters on the Boston & Lowell, the Concord, the Boston & Maine and Fitchburg. The Maine Central has a chapter and another is given to the Systems in Vermont. Prof. Baker has traced the growth of each of these systems in an interesting fashion and it is a book that you can enjoy reading.

Since this book has been out of print, many of our members have requested as to where copies might be obtained. This is a relatively small edition that is being published and, now is the time to act. The book contains 271 pages, is indexed and the maps help you understand the location of the individual lines. The cost is $4.50 and copies should be ordered from The Harvard University Press, 44 Francis Street, Cambridge (38), Mass. Better order your copy now before it is too late.

Worth Reading

Compiled by

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BOOKS AND PAMPHLETS

American Railway Engineering Association. Golden Jubilee Year Book 1949. (Its A.R.E.A. BULLETIN, Vol. 50, No. 480. March 1949. 119, 265 p. incl. ports.) Price on request to W. S. Lacher, Secretary, 59 E. Van Buren St., Chicago 5, Ill. *Part I—Historical* Section, includes: "American Railway Engineering Association—Fiftieth Anniversary—a Past of Achievement—A Future of Opportunity", by C. H. Mottier, president, pp. 9-25; "Summary of financial statement—1900-1949", p. 26; "Presidents of the AREA," pp. 27-36; "Secretaries of the AREA", p. 37; "Record of Membership", p. 38; "Circulars issued prior to the First Annual Convention", pp. 43-46; "Charter Members . . ."; pp. 47-59; "The National Railway Appliances Association—a Brief History, by M. K. Ruppert, president . . .", pp. 76-80; "The American Railway Engineering Association—Its First Fifty Years", by Merwin Dick, engineering editor, Railway Age, pp. 81-119. *Part II—Membership and Statistical Section.* 265 pp.

Association of American Railroads. Bureau for the Safe Transportation of Explosives and Other Dangerous Articles. Report of the Chief Inspector . . . [H. A. Campbell]. *March 1949.* 34 p. B. E. Report No. 42. Price from Mr. Campbell, 30 Vesey St., New York 7, N. Y. ". . . No persons were killed or injured due to rail transportation of commercial explosives during 1948. This marks the end of the 27th consecutive year in which no explosions occurred in connection with the rail transportation of Class A commercial explosives . . . The total reported property loss resulting from the transportation of explosives of all kinds was $9,834, of which $8,000 is chargeable to a fire involving military smoke producing devices classed as 'fireworks' under Interstate Commerce Commission regulations . . ." (p. 4). "Numerous shipments of radioactive materials have been added to the long list of other dangerous articles now moving in rail transportation. Contrary to a rumor which gained some publicity there has been no serious accident as the result of rail transportation of these materials . . . The work of the Bureau included allaying the fears of persons who became alarmed at the possibility of radioactive materials exploding as did the atom bomb, or causing other materials to become radioactive due to the effects of nearby radioactive substances. . . ." (p. 5-6).

Association of American Railroads. Communications Section. Reports to be presented at the 26th (annual) session . . ., Portsmouth, N. H., Sept. 27-29, 1949. 354 p. incl. illus., graphs. Price from A. H. Grothman, Secretary, 30 Vesey St., New York 7, N. Y. "A general description of printing telegraph apparatus and its application to railroad

service" pp. 127-191. "Radio and allied communications as applied to railroad operations" pp. 196-224, includes: "Train, Yard, Terminal and Utility Stations Authorized in Railroad Radio Service" as of May 15, 1949, pp. 119-201.

Association of American Railroads. Signal Section. Reports to be presented at the 51st annual meeting, Chicago, Ill., Sept. 12-14, 1949. (pp. 4-439 in its 1949 Annual Meeting Advance Notice). Price from R. H. C. Balliet, Secretary, 30 Vesey St., New York 7, N. Y. "Advantages of rock slide detector fences", p. 65. "Automatic train control and signals—State and Dominion activities", pp. 148-190. "Automatic train control and automatic cab signals in the United States as of January 1, 1949", pp. 191-195. "Electronics as applied to railway signaling", pp. 385-439. "Noteworthy changes in signal practices—Automatic switching" in a classification yard, p. 364.

Baldwin Locomotives—Baldwin—Index 1922-1948, prepared by Thomas T. Taber III and Paul T. Warner. 71 p. Hillside 3, New Jersey, Railroadians of America, N. G. Bergenholtz, Secretary, 1416 Hillside Ave. $2.00.

Chicago Railroad Fair 1949. Official Guide Book and Program for the Pageant 'Wheels a-Rolling'. [16] pp. incl. illus. 35 cents. Mail orders to F. J. Ashley, public relations counsel, Chicago RR Fair, Inc., 23rd St. and Lake Shore Drive, Chicago 37, Ill. List of railroads presenting fair and lists of officers, directors and staff, inside front cover. ". . . Every exhibit this year has been devised to depict the wealth that is America's . . ." *(In* . . . 2nd Great Year, June 25th to October 2nd, 1949, p. [1]. "Headlines in American Transportation History" p. 16, lists "originals" and "replicas" of Railroad Equipment; Horse-Drawn and Man-Drawn Equipment; Bicycles, and Older Model Automobiles, used in 'Wheels a-Rolling'.

Federation for Railway Progress presents a clearer view of the railroads—a report on the industry's performance in 1948 . . . 8 p. Washington 5, D. C. Federation . . ., Railway Progress Bldg. Free on request.

Great Britain. British Transport Commission. First annual report; Statement of accounts and Statistics for the year ended 31st December 1948. Ordered printed by the House of Commons 28th July 1949. xvi, 424 p. London, England, H. M. Stationery Office. For sale in U. S. A., by British Information Services Sales Office, 30 Rockefeller Plaza, New York 20, N. Y. $2.20. *Report,* pp. 1-175, includes Ch.1. The Creation of the Organization; 2. The Taking Over and Its Immediate Problems; 3. Progress towards the objective of the Transport Act; 4. Staff; 5. Finance; 6. The Organisation and operations of the Executives [Railway; Road Transport; London Transport; Docks & Inland Waterways; Hotels] during 1948. *Financial & Statistical Accounts,* pp. 177-402.

Head-end horsepower, by Lewis K. Sillcox. 26 proc. pp. Salzberg Memorial Lecture, Syracuse University, New York, April 26, 1949. ". . . It is noteworthy to record the fact that the evolution of the locomotive was more rapid than the evolution of the track upon which it had to

run. . . ." (p. 3). ". . . The locomotive is still in process of evolution, although it would almost seem that in many respects, such as weight, size, and tractive power, the highest limit has been closely approached. . . ." (p. 4).

Historical Statistics of the United States 1789-1945. A Supplement to the Statistical Abstract of the United States, by Bureau of the Census, U. S. Department of Commerce. VIII, 363 p. Washington 25, D. C., Superintendent of Documents Office, $2.50. *Transportation,* Ch.K, pp. 188-225. *Time-period* and alphabetical subject indexes, pp. 353-363.

India—15 August 1948 to 15 August 1949, prepared by and available on request to Indian Embassy Educational Attaché, 635 F St., N. W., Washington 1, D. C. "Transport and Communications" pp. 31-34.

India, Railway Board, Report . . . Indian Railways for 1947-48. Vol. 1. vi, 96 p. Illus. Published by Manager of Publications, Delhi, India, 1949. Price, Rs. 5-2 or 8 sh. ". . . The year 1947-8 will be remembered as a memorable period for the Indian Railways. That year witnessed the beginning of a new epoch for the country with the attainment of Independence. The division of the country into two Dominions led to the partition of the two railways, the North Western and the Bengal Assam . . . The profound changes on the political front led to repercussions on railway working, which were unprecedented in their character and consequences. . . . There have been special difficulties in preparing the present report . . . The Report deals with the Indian Railways as they stand after partition for the entire financial year. . . ." (p. 3).

Note: Food supply, domestic and imported, and its transportation are discussed in both reports.

Location survey for a railroad to connect Alaska and the United States—Report to accompany H. R. 2186—from the House of Representatives Committee on Foreign Affairs. "August 24, 1949—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed." 4 p. 81st Cong., 1st sess. House Report No. 1318, for sale by Superintendent of Documents Office, Washington 25, D C. I. The Importance of Alaska, p. 2 mentions: ". . . There are no railroad lines connecting the United States and Alaska. The present bill is a first step in determining the feasibility of filling this gap." II. Surface Transportation System of the Northwest, pp. 3-4. III. Previous surveys, p. 4, mentions 1942 location survey made by Corps of Engineers ". . . made to meet the requirements of a military railroad only. IV. Conclusions, p. 4. mentions "Alaska now depends for its supply on a vulnerable sea line of communication and on a highway that needs great improvement and is difficult to maintain. . . . The survey needs to be brought up to date. . . The decision on whether there shall be built a railroad . . . can hardly be taken until there is a firm basis of fact and recommendation on which to proceed. This bill proposes to provide the authority and means to get these facts and recommendations. "H. R. 2186 as amended by this report was debated and passed by the House on Aug. 24, 1949—*see* Congressional Record, daily edition no. 155:

12410-12411; August 24, 1949, and watch the Record for Senate action on the bill.

Locomotives of the L. N. E. R.—a pictorial record. by E. R. Wethersett and L. L. Asher. ix, 122 pp. Cambridge, England, W. Heffer & Sons, Ltd., 7 shillings 6 pence. "An attempt has been made in this book to present an illustration of every class of locomotive in service on the London and North Eastern Railway."

Manila Railroad Company: Brief historical sketch. (p. 8-11 *in* Manila Railroad Co., Philippine Islands. Report of the general manager [Sergio Bayan] for the fiscal year ended June 30, 1948). Published by the Company in 1949.

National transportation policy, by Charles L. Dearing and Wilfred Owen. 449 pp. Washington 6, D. C., The Brookings Institution. $4.00. Brookings Report to U. S. Committee on Organization of the Executive Branch of the Government, Herbert C. Hoover, chairman, that was not printed as a "task force report" in the "Hoover Commission series".

Oakland, Garrett County, Maryland, Centennial History, 1849-1949, by Thekla Fundenberg Weeks. Oakland, Maryland, Centennial Commission, Inc. 105 p. map, illus. "Our centennial also corresponds to the one hundredth anniversary of the construction of the Baltimore and Ohio Railroad across the mountains; in fact it was the location of the railroad which gave birth to the town. For this reason we have included in this history a chapter on the building of that great artery of traffic through this area.". . . Ch. II. The Baltimore and Ohio Railroad Through Garrett County" pp. 32-35.

Pan American Railway Congress, 7th, Mexico City, Mexico, Oct. 1950 Themes set by the organizing committee approved by the Permanent Commission and the National Commissions. Mexico City, June 1949. 7 p. Copies available in U. S. A. from U. S. National Commission in the Pan American Railway Congress Association, Walter S. Abernathy, executive secretary. Room 1868-A, Dept. of Commerce Building, Washington 25, D. C. Reprinted from Boletín de la Asociación Permanente, Congreso Panamericano de Ferrocarriles, Buenos Aires, Argentina, No. 111, Mayo-Junio de 1949, pp. 44-50; Spanish version pp. 37-43.

Report of the Locomotive Testing Committee on the locomotive interchange trials 1948, issued by Railway Executive, British Transport Commission, London, England, 1949, in a limited edition. 131 mimeo. l., tables, fold. diagrams. ". . . It is not intended to make copies available to the public because of the cost of large-scale production . . ." Summaries of text and reprints of some of the tables in Railway Gazette, London, England, July 1, 1949, p. 5; July 29, pp. 116-117, with editorial comment: The Locomotive Exchanges, August 5, pp. 144-145; in Railway Age, August 27, 1949, pp. 376-378.

Universal Directory of Railway Officials and Railway Year Book, 1949-1950. 55th year of publication. 632 pp. London, S. W. 1, England, The Directory publishing Co., 33, Tothill St., Westminster. 30 shillings. Directory section, containing names and addresses of ministries, railroads, and organizations, historical sketches of each of the larger railroad systems, with names and addresses of their respective officers, and the officers of smaller railroads, revised in this edition into two divisions: British Commonwealth, regardless of dominion or colonial status and Foreign. Each division is again subdivided geographically into Continents. Statistical section revised, chronology of railroad history has been brought down to date, and a new feature included—a chronological table of major developments in locomotive design, based upon and amplified from Lt.-Col. Harold Rudgard's table listing developments from 1801-1919 that accompanied his presidential address to Institution of Locomotive Engineers, Sept. 1948. "Railway Bibliography" comprises British publications chiefly, and "does not cover the hundreds of books, pamphlets, etc., of the early railway period. . . ."

What we have learned in a year, by L. K. Sillcox. Address at Yale University, May 17, 1949. pictorial covers, 34 proc. pp. New York 17, N. Y., The New York Air Brake Co. ". . . The present rather dark economic outlook, although very serious in some ways, is no more than a surface problem, since any country possessing the capabilities and the possibilities that this country possesses could not possibly fail to achieve success in the long run. The one modification that can be made regarding this optimistic statement is that if anyone ever does ruin this country, as we know it today, it will be the people within it, who refuse to view *both* sides of all the problems and situations that confront them. . . ." (p. 10)

ARTICLES IN PERIODICALS

'Collector's Items'. Antiquarian Bookman, May 14, 28, 1949, pp. 1259; 1383. ". . . Bruce Rogers . . . paused for a spell of work in the yards of the Missouri, Kansas & Texas Railroad Company at St. Louis, where, in the car repair shop, he was required to do some painting on reconditioned boxcars . . . Mr. Rogers let himself go and produced on one of them the letters M-K-T, enclosed in an irregular border . . . that are still the decorative trade-mark of the railroad. Wherefore, assert certain facetious Rogers enthusiasts, no collection of the work of Bruce Rogers is complete that lacks an M-K-T boxcar.

"It wasn't a Katy trademark at all [writes Mr. Rogers] it was a Texas-Pacific . . . Your Apocryphal story is much more interesting than the actual story, as is frequently the case."

End of the Southern Railway Company. Railway Gazette, June 17, 1949, p. 600. ". . . first of the former main-line railways [in Great Britain] to cease to exist . . ."

"From Minneapolis to the Seaboard—The Great "Soo" Road Completed". Reprinted from Saturday Evening Spectator, Minneapolis, Minn., Jan. 21, 1888, *in* Soo Line Sentinel No. 1 [August 1949], pp. 2-3. *see also Minnesota Travel Log:* 1849-1949—photographs reprinted on p. 4.

Freight Progress Numbers—1949. Railway Age, May 21, 1949. "Leaders of the Fast Freight Fleets" pp. 128-129. "Fight for Freight Is On—Many of the railroad's competitors appear to flourish, . . ." pp. 130-133. " 'Your Money AND Your Life'—Uncle Sam . . . reparations . . ." pp. 156-158. "Capturing Industry on the March—Expansion and decentralization changing traditional traffic patterns—relocation a challenge to the carriers— . . ." pp. 168-171. "Many Stations Can Handle Unit Loads"—list of 650 by states, pp. 179-183. "Modern Signaling—The Expediter" p. 186-187.

Historical highlights—a condensed, illustrated history of the Jersey Central Lines. J. C. Coupler, April 1949, pp. 6-20. Illus., Map, Facsims.

Major line relocation nears completion—Pennsylvania project, necessitated by flood-control work, involves 17 mi. of road— . . . Railway Age, May 28, 1949, (pp. 22-29.) Illus. Maps. Diagrs. "The Connemaugh Division main line is of great importance to the Pennsylvania as a freight traffic route between the West and East. . . . The Connemaugh flood-control project is outstanding among such dam projects in that the incidental work—of which the railroad relocation is the largest single item—will cost considerably more than the dam itself. . . ."

Pascagoula builds a ship channel— . . . without federal aid. Railway Age, June 18, 1949, pp. 60-61. Illus. "A Very Solvent Railway" p. 61, begins: "In addition to the L. & N., the new port is served by the Mississippi Export, a 42-mile railway . . . Originally a logging line, . . . It is completely Dieselized, and as the result of the purchases of large quantities of ties and rails from the War Surplus Administration, is in the finest physical shape of its history."

Pittsburgh landmark comes down—Wabash bridge of the Pittsburgh & West Virginia, for 44 years a symbol of George Gould's invasion of the city—dismantled after falling into disuse following destruction of terminal facilities by fire. Railway Age, June 11, 1949, pp. 42-44. Illustrations include: photographs with captions: *Going up in 1904* —and *Coming down in 1948.*

Railroading in Stampdom—more than 800 railroad stamps have been issued by 78 different countries. Railway Age, August 27, 1949, pp. 42-43. Facsimiles of 7 stamps include "The first railroad stamp issued by the United States" p. 42.

Ralph Budd switches jobs—500 of his friends felicitate him as he retires from Burlington to assume chairmanship of Chicago Transit Authority. Railway Age, September 3, 1949, pp. 46-50. Portrait by John Doctoroff, p. 46. ". . . On the eve of his retirement from the Burlington, August 31, . . . friends from the transportation and allied industries gave a dinner in his honor at the Harbor View Restaurant at

the Chicago Railroad Fair which had set this date aside as 'Ralph Budd Day'. . . ."

A Reporter in Germany—Die Luftbrücke, by E. J. Kahn, Jr. The New Yorker, May 14, 1949, pp. 37-56. ". . . Nothing quite like the airlift has ever happened before . . . Among the products manufactured by the West sectors' still-struggling factories are small locomotives, which have been exported, in airlift planes, to the coal mines of the Ruhr, . . ."

Short-run streamliners doing better than ever—C. of Ga.'s streamliners in sparsely populated territory increased 1949 traffic over 1948. Railway Age, August 6, 1949, p. 47. ". . . 'Nancy Hanks II,' (built by American Car & Foundry), and 'Man o' War,' (built by Budd), now beginning their third year of operation, . . ." see also in Railway Age, September 3, 1949, pp. 12-18, Budd's advertisement: *Man o' War completes second profitable year,* which quotes "a Central of Georgia official"—"We feature attention to children . . . We've made up a bib inscribed 'I rode Man o' War' . . . Many of our passengers . . . want one to take home, but so far we have adopted the rule—'No kid, no bib.' . . . The train is attracting organized groups. . . . Another by-product has been the stimulation to the morale of our employees. They all take great pride in Man o' War. . . . this spirit of cooperation is not confined to the men who actually operate the train, but extends to all our people. . . ."

Small Diesel shop sets pace in design—Facility built by Detroit, Toledo & Ironton, . . . incorporates all features common to larger structures, and some new ones not previously used. Railway Age, June 4, 1949, pp. 36-39. Illustrated. "Construction Details" p. 38.

Sr. William T. Faricy, presidente de la Comisión Nacional de los Estados Unidos de America de la Asociación del Congreso Panamericano de Ferrocarriles. Boletín de la Asociación del Congreso Panamericano de Ferrocarriles No. 111, Mayo-Junio de 1949, port. inserted between pp. 88-89. *Designación de la Comisión Nacional,* pp. 89-91, lists all members of the Commission, with brief sketches of their careers, and of the executive secretary, Walter S. Abernathy. Mr. Abernathy's address is given in note following Pan American Railway Congress' program for 1950 listed in *Books and Pamphlets.*

Tough tunneling on new coal line—Elk Creek spur of the Baltimore & Ohio opens new fields containing an estimated 100,000,000 tons of high grade fuel—difficult construction of 1,517-ft. bore through abandoned mine workings was feature of the project. Railway Age, August 20, 1949, pp. 56-58. Illustrated. Map of B&O lines near Grafton, W. Va., showing location of Elk Creek Spur of Berryburg branch, p. 58.

Transport and communications in United Nations trust territories. Transport and Communications Review, United Nations, April-June 1949, pp. 32-63. "This study includes only non-strategic areas . . ." Maps: 1. Non-strategic trust territories; 2. Tanganyika & Ruanda-Urundi principal transport routes; 3. Cameroons principal transport routes.

TALGO—some descriptions in periodicals, February—August 1949:

Talgo & Train X . . ., by David D. Frank. Wall Street Journal, Feb. 18, 1949, pp. 1, 5. Translated in part in ferroviarios, Madrid, Spain, listed below.

Peacetime secret. Connellsville, Pa. Courier, Feb. 19, 1949. Reprinted in Wheels, May-June 1949, inside back cover.

El Tren articulado Español en los Estados Unidos. ferroviarios, Madrid, Spain, March 1949, pp. 15-18. Illustrations and diagrams.

An Underslung train for Spain tested in N. J., by Leslie Midgley. New York Herald Tribune, April 21, 1949.

A. C. F.—TALGO takes to the rails— . . . Railway Age, April 23, 1949, pp. 30-35. ". . . was introduced to the public for the first time on April 20, . . . press run between Hoboken, N. J., and Dover over the tracks of the Delaware, Lackawanna & Western. . . ." Illustrations and diagrams.

The Talgo; . . . Life, April 25, 1949, pp. 83-86. Illustrated.

ACF testing "Talgo" type passenger train. Railway Purchases & Stores, May 1949, pp. 120-122. Illustrated.

Diesel Train Talgo. Diesel progress, May 1949, p. 47. Illustrated.

a.c.f.—TALGO train. Wheels, American Car and Foundry Co., May-June 1949. cover-title, 40 pp. including illustrations and diagrams. Dedicated to "ACF's Co-sponsors of the Talgo . . ." the four Señores de Oriol, two of whom wrote the Foreword, pp. 2-3. "Once upon a time . . ." pp. 4-7; "Why the a.c.f.—TALGO?" pp. 8-15; "The ACF—TALGO train" pp. 16-20; "The ACF-TALGO coaches" pp. 20-27, translated under title: "El nuevo tren ACF-TALGO" in Ferronales, July 1949, pp. 23-25; August 1949, pp. 6-9, with reprints of some illustrations and diagrams.

A New railroad experiment. [a.c.f.—TALGO] Exide Ironclad Topics, Summer 1949, pp. 2-3.

New ACF-Talgo train—sets a precedent in railway construction. Diesel power & Diesel transportation, June 1949, pp. 44-50. Illustrated.

Startling departure in passenger trains. [a.c.f.-TALGO]. Canadian transportation, June 1949, pp. 294-295. Illustrated.

Talgo train. Modern Railroads, June 1949, pp. 30-37. Illustrated.

New lightweight train in U. S. A.— . . . ". . . built by the American Car & Foundry Company under Spanish patents . . ." Railway Gazette, London, England, June 14, 1949, pp. 699-700. Illustrations and diagrams.

"Talgo" train at railroad fair. Railway Age, July 23, 1949, p. 50. "On July 15 . . . 'Talgo' train joined the array of attractions at the Railroad Fair in Chicago, , ... some 35,000 persons passed through the locomotive and coaches during the first three days they were open to the public. The train came direct to the fair via the Pennsylvania from A. C. F.'s plant at Berwick, Pa."

ACF-Talgo is entirely new type train. The Railroad Journal, August 1949, pp. 10-13. Illustrated.

Talgo train—and the track. Railway Engineering and Maintenance, August 1949, p. 771. Illustrated. ". . . A feature of the train of particular interest to those concerned with track design is its demonstrated ability to run at appreciably higher speeds on curves than conventional trains. There are two reasons for this: . . .

There has been considerable speculation regarding the possible effect that general adoption of Talgo-type trains would have on railroad practices with respect to curve reduction and super-elevation. One line of reasoning is that the need for curve-reduction work would be greatly lessened. Another is that, since the Talgo-type train can take a curve at a considerably higher comfortable speed, super-elevation generally could probably be reduced."

What owner management is accomplishing on the Norfolk Southern —attains dividend status via "dynamic retirement," debt reduction, expense controls and Dieselization. Railway Age, July 23, 1949, pp. 28-32, 35. Illustrations, Maps, Tables.

Henry Earle Riggs

In the fall of 1912, Henry E. Riggs was appointed full professor and placed at the head of the Civil Engineering Department of the University of Michigan. A graduate of the University of Kansas in 1886, he had seen service with the Atchison, Topeka & Santa Fe R. R. and he subsequently served as chief engineer of the Ann Arbor R. R. In 1900 he was appointed at the request of Gov. Hazen S. Pingree to make a financial evaluation of all of the railroad properties in Michigan. He entered the University of Michigan and received his degree in civil engineering in 1910. He was then called by Mortimer E. Cooley, then dean of the engineering school, to reorganize the civil engineering department and he was subsequently placed in charge, remaining there until 1930, when he retired with the title of honorary professor of civil engineering.

It was during the senior year of your editor, at Ann Arbor, that he took four courses in civil engineering under Prof. Riggs. Well, your senior year you are supposed to be pretty well caught up in your work and the courses should be not too difficult. This, together with the feeling on the part of some of the students that he was just fresh from the field and would not be too severe, made some of them hopeful. Altho' Prof. Riggs suffered from a slight impediment in his speech, his mind was as keen as the edge of a razor. He did not share the views of some of the students, their senior year was the time to prepare for the years of work that were to follow—there was no "guess work" in engineering —you either knew or you did not know and the final examination in one of his courses, took four hours and ten minutes of steady writing to answer all of the questions as he required, by your editor. The door to his office was always open to any of his students, no question was too trifling in that it did not call for serious consideration and his well rounded experience in railroad work made him a delightful conversationalist, whether on motive power, operation or track layout.

He was one of the three men selected to place a valuation on the Detroit United Rys., when Detroit sought to buy it for a municipally-owned railway. In 1937 he was elected president of the American Society of Civil Engineers and he headed the Michigan society several times. He was instrumental in starting the Transportation Library at Ann Arbor, a library that ranks high both in quantity and quality of its material. On July 5th, at the age of 84, Henry E. Riggs, one of the early Life Members of this Society, passed away in Detroit.

Of the many that the writer studied under during his college years, the friendship with that of Prof. Riggs lasted until its termination, caused perhaps by a bond of common interests. He was a man that commanded the respect and admiration of his students; you knew that he knew the subject and you could not "bluff" him, either in class or in examination but there was the friendly attitude and "open door" policy that appealed to all. He did make engineers out of men and your editor is proud to have been one of his "boys."

Bernard Hoffman

Bernard Hoffman, born in Stockbridge, Massachusetts, graduate of Cornell University in 1895 as an electrical engineer, with the New York Telephone Company until 1916, serving in the armed forces in the Spanish-American and World War I, with Herbert Hoover during the Food Administration and Life Member of this Society, passed away on July 6th.

He was not only an engineer; he was a planner and a conservationist. In 1919, Santa Barbara, California, was subjected to some of his ideas when he made that city his winter home. After the 1925 earthquake there, he was the leading official in the restoration of that municipality and in that city will be found a plaque, dedicated to Mr. and Mrs. Hoffman "for the beauty and inspiration which they have given Santa Barbara."

He loved his Stockbridge in the Berkshires; he was called the "informed meddler" but they all loved him for it. It mattered not whether it was selective forest cutting, by-passes, limited access highways, roadside and village zoning, a clean Housatonic or the preservation of beauty spots and historic shrines; with his gentle but constant prodding, his tactful and intelligent suggestions, his ready praise and warm support, he was regarded as a minister-without-portfolio by every public or private body concerned with orderly living in the Berkshires. Death came on July 6th, at the age of 74, while he was preparing to attend the music concert at Tanglewood.

In Memory Of

MILLARD S. BROWN

Annual Member

1601 Fifth Ave., San Rafael, California,
who died on May 10th, 1949.

G. A. DOERIGHT, JR.

Annual Member

Kirtland Drive, Poland, Ohio,
who died on August 15th, 1948.

NATHAN W. FAY

Annual Member

East Ely, Nevada,
who died on May 16th, 1949.

DAVID FIELD

Annual Member

457 North Seward Ave., Auburn, New York,
who died on October 1st, 1948.

JUDGE SHERMAN R. MOULTON

Annual Member

178 South Prospect St., Burlington, Vermont,
who died on June 16th, 1949.

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